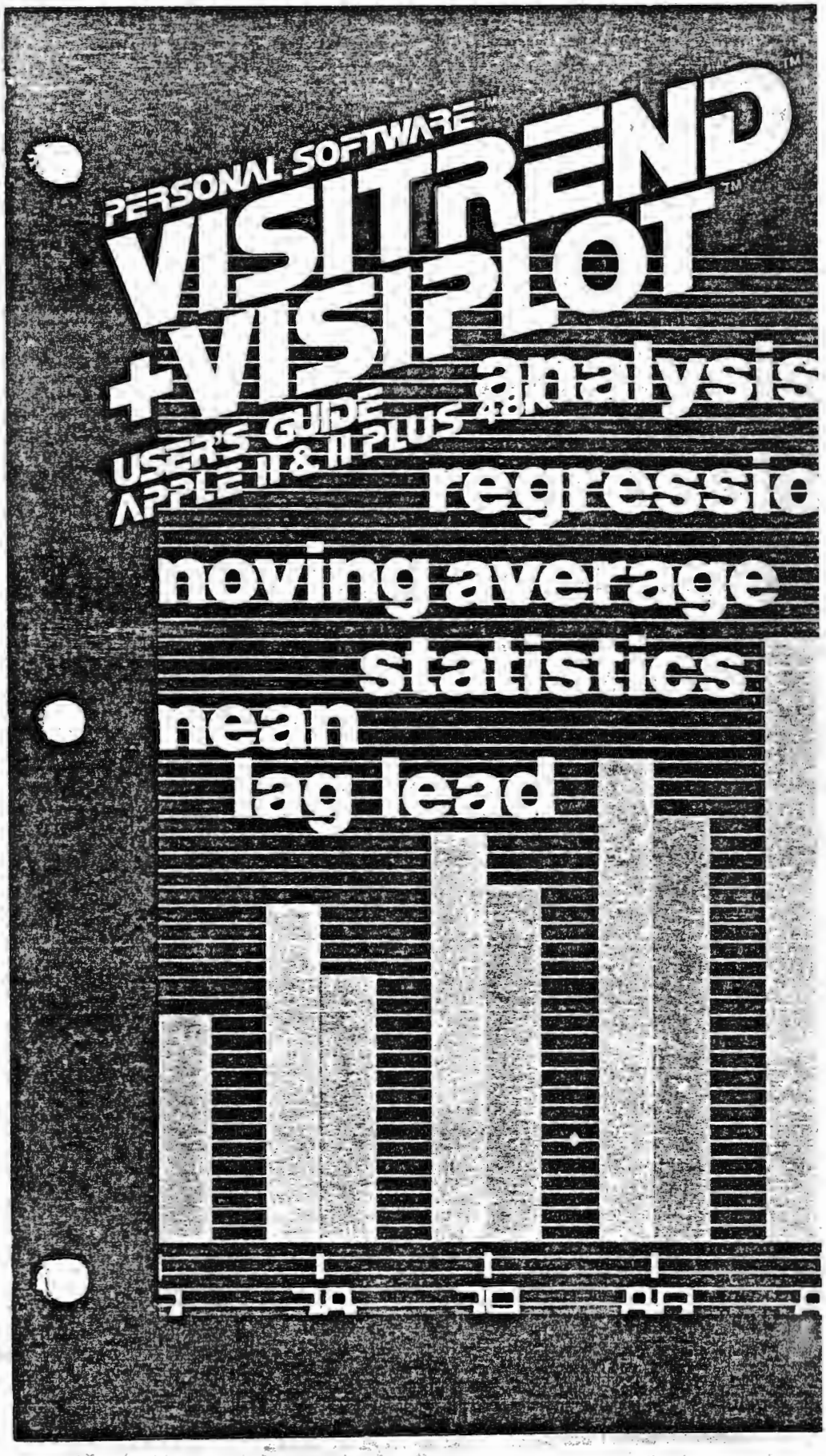
PERSONAL SOFTWARE™

VISITREND™ +VISPLOT™

USER'S GUIDE
APPLE II & II PLUS 48K



Printed in U.S.A.

PART NUMBER: 10939-22101 7/81

VISITREND™ +VISIPLOT™

USER'S GUIDE

Program by:

MITCHELL KAPOR
MICRO FINANCE SYSTEMS, INC.

Manual written by:

RICHARD EWING

Special Credits:

ERIC ROSENFELD
AND
DEBRA SPENCER
FOR ALL THEIR HELP

PERSONAL SOFTWARE INC.
1330 Bordeaux Drive, Sunnyvale, CA 94086, 408/745-7841

PREFACE

CHAPTER 1
INTRODUCTION

CHAPTER 2
VISITREND/VISIPLOT TUTORIAL

LESSON ONE

LESSON TWO

CONTENTS

LESSON THREE

LESSON FOUR

LESSON FIVE

CONTENTS

CHAPTER 3
REFERENCE

APPENDIX A

APPENDIX B

APPENDIX C

TABLES

PREFACE

This manual, which describes the use of the VisiTrend™/VisiPlot™ program, is divided into three parts.

The first part is an introduction that describes the VisiTrend/VisiPlot program and what it does. It provides the basic information you need to load the program and to use the keyboard and cursor.

The second part is a series of five lessons that describe the major functions of the program and lead you on a step-by-step tour through their use.

The third part is a reference guide. It provides the information you need when you know how to use the program but have not used a certain function in a while. This guide also provides the information you need to execute those functions that are not covered in the lessons.

HOW TO USE THIS MANUAL

This manual is first a tutorial designed for use with the VisiTrend VisiPlot program and your computer. You should begin in the Introduction and continue through the lessons in order. The later lessons assume you have information and knowledge you acquired in earlier lessons.

The sequence of the lessons is designed to let you use the plotting and output capabilities first. It is satisfying to see your computer display complex graphics. After seeing the output capabilities, the manual describes the portions that let you save and access data, enter and modify data, and perform statistical analysis on the data.

After you learn how to use the program by actually doing, the Reference section provides information on the capabilities and limitations of those functions you have not yet used. It will also refresh your memory on functions you have not used in some time.

If you are an experienced VisiPlot™ program user and have now purchased the VisiTrend/VisiPlot program, you can skip over or merely skim all lessons except Lesson Four which describes the VisiTrend™ program. You should also read the Introduction up through the section titled "Some Definitions."

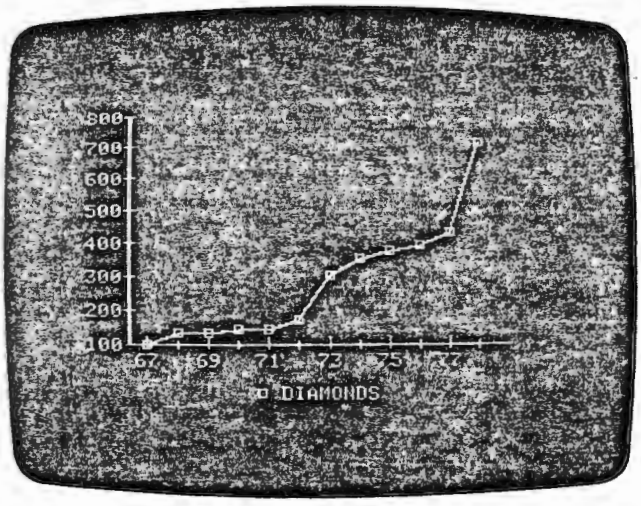
INTRODUCTION

The VisiTrend™/VisiPlot™ program turns your Apple® II computer in a combined time series analysis and graph plotting system. With th program you can enter and save business data, perform complex for casting and analysis operations, display charts of your current status an future goals on your screen, print them on your printer, and save diskette a representation of the chart for use by another program. Th VisiTrend/VisiPlot program communicates with the VisiCalc™ progra and all other Personal Software™ programs that support DIF™ (Dat Interchange Format) files.

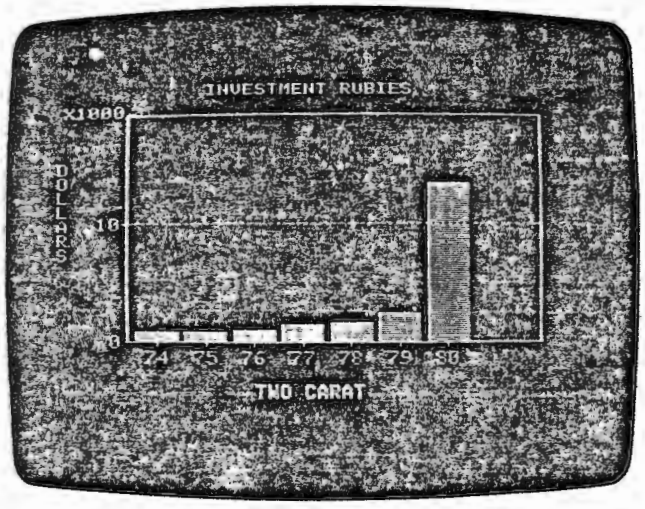
The VisiTrend portion of the program:

- Develops ancillary data series used in analysis and forecasting tech niques. The available methods include derivation of moving average smoothed data, percent of change, leading, lagging, and cumulativ total functions. Additionally, new series can be created by taking sum ratios, logs, or other mathematical or logical transformations on th data.
- Performs linear multiple regressions (using the ordinary least square method). It calculates and displays the major statistical measures of multiple regression including the standard errors of the coefficient and the regression, T-statistic, R-Bar squared, the F-statistic, and th Durbin-Watson statistic.
- Performs trendline forecasting.
- Calculates and generates tables of statistical measures such as mini mum, maximum, mean, variance, standard deviation, and correlatio coefficient.

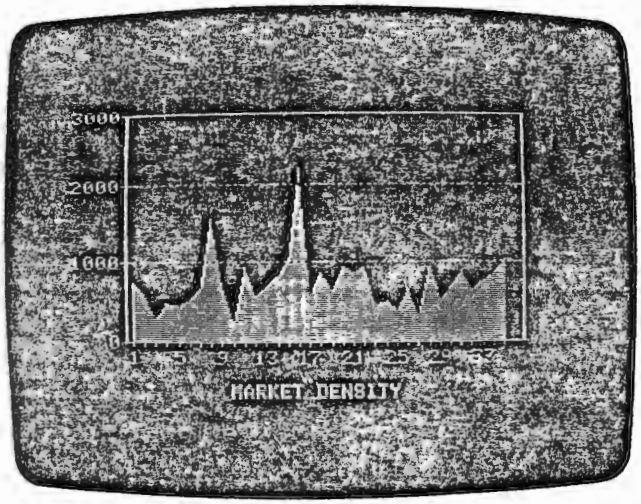
The VisiPlot portion of the program aids in the evaluation and communication of these statistical tools and measures by generating the types of charts shown in the following photographs.



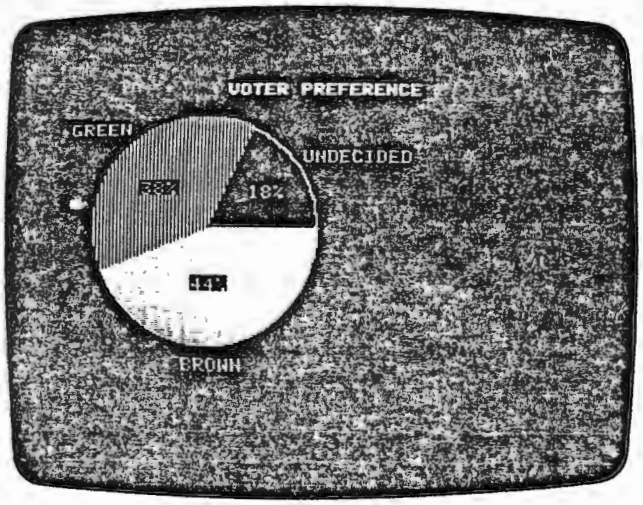
Line Chart



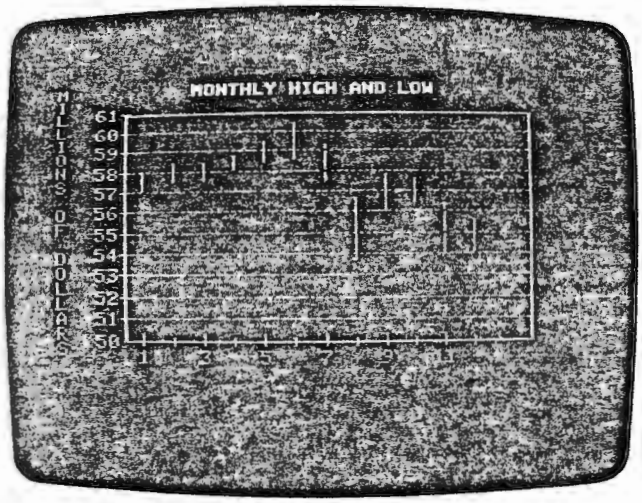
Bar Chart



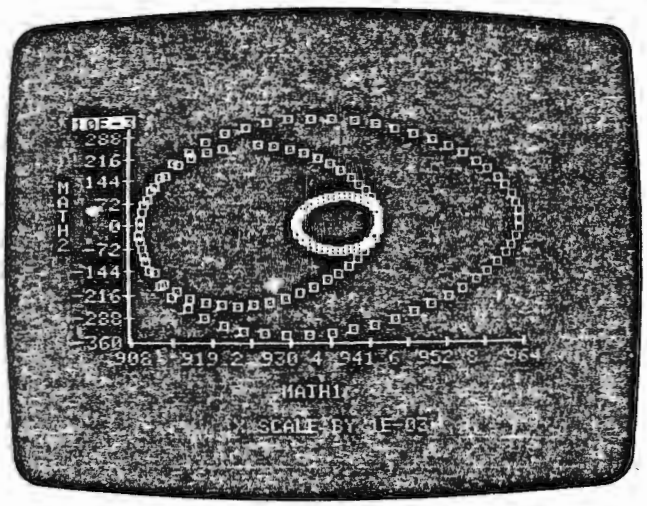
Area Chart



Pie Chart

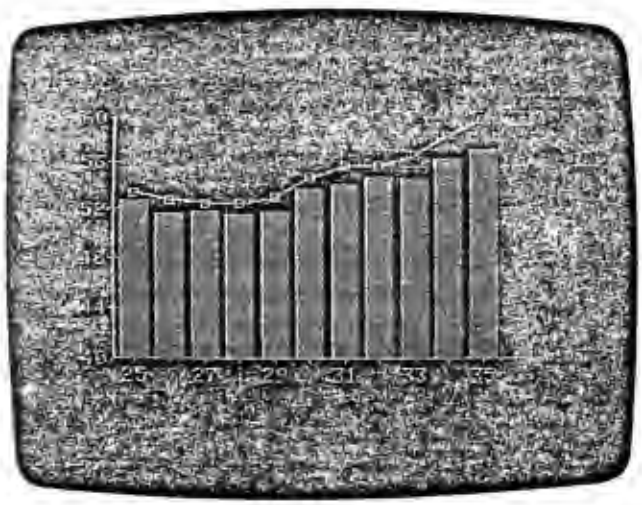


Hi-Lo Chart

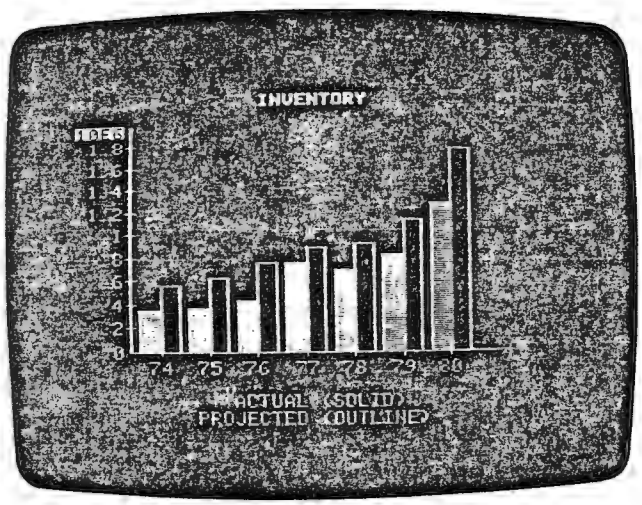


Scatter Chart

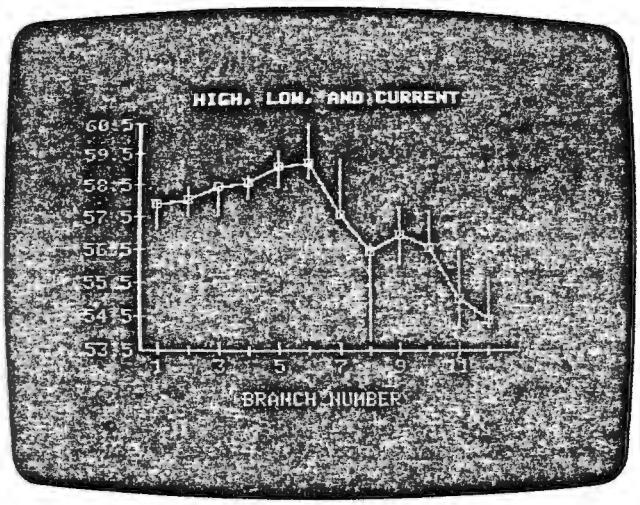
Additionally, with the use of the VisiTrend/VisiPlot overlay and window capabilities, combinations of all the formats, except Pie, are possible. (A Pie chart is a unique form that is always handled separately.)



Line and Bar Chart



Comparative Bar Chart



Hi-Lo and Line Chart

THE VISITREND/VISIPLOT FEATURES

The VisiTrend/VisiPlot program offers more than just a repertoire c statistical tools and chart forms:

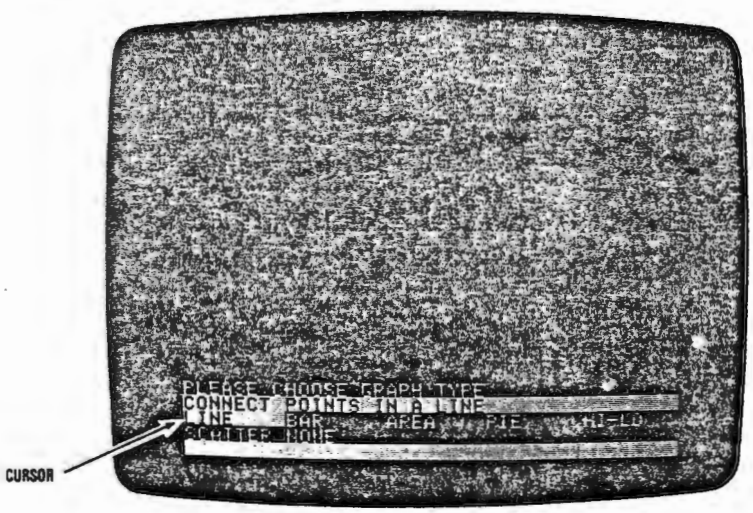
- There are complete storage management facilities for reading an writing to diskettes, organizing data series into files for efficient pe manent storage and easy retrieval, and simple handling of data serie in memory and their protection while changing programs.
- It provides data entry and editing functions in both the storage mar agement area and the statistical analysis area.
- It can handle 16 data series with a maximum of 645 data poin in memory. A single chart can contain up to 150 data points. Th VisiTrend/VisiPlot program analyzes the data in a selected serie or multiple selected series and automatically determines the be X-axis and Y-axis value ranges for that chart.
- It automatically generates different plotting symbols for line char with multiple data series. It selects different colors for different serie in multiple line, bar, and area charts.

- The VisiTrend/VisiPlot titling features are extensive. A chart can have as many as five fixed title lines—three at the bottom of the chart, one at the top, and one at the left. There is no limit to the number of moveable title lines you can put into a chart. A moveable title line can be placed anywhere in a chart. Most fixed titles can be displayed in a regular or bold typeface.
- The program can output finished charts to several graphic printers: the Apple Silentype™, the IDS 440G and 445G Paper Tigers™, the Trendcom 200, and the NEC Spinwriter™ models 5510, 5515, 5520, and 5525. Appendix B of this manual lists the features that must be installed in each of these printers and the required settings of the switches on the printers. The VisiTrend/VisiPlot program prints data listings to most printers that can be plugged into the Apple II or Apple II Plus.
- The VisiTrend/VisiPlot program also provides the means of writing chart data to diskette for use by other programs, such as output drivers for other graphic printers or display programs to redisplay the charts on a monitor or TV.
- Color display capability is a standard part of the program. You can display your charts in blue, green, orange, violet, black, and white. You have control over the choice of background colors as well as plotting colors. The program provides standard color selections that display well together. On black and white display screens, blue, green, orange, and violet display as a shade of grey easily distinguished from black and white.
- Foremost among the VisiTrend/VisiPlot features is the support of DIF files. Through the use of this data format, data from other sources, such as the VisiCalc program, can be loaded and plotted with the VisiTrend/VisiPlot program. In a like manner, VisiTrend/VisiPlot data can be saved as a DIF file and then loaded by those programs that support DIF files.

USING THE VISITREND/VISIPLOT PROGRAM

The VisiTrend/VisiPlot program is easy to use. There is no detailed syntax to learn or look up, no special keyboards to memorize, and no abbreviations to confuse you. The VisiTrend/VisiPlot programs are menu driven. This means that they display a menu of the options from which you can choose. With the very simple technique of pointing to an option with a cursor and pressing a single key, you can perform a very complex operation such as a multiple regression or the graphic plotting of a time series.

A cursor is a graphic device that appears on the screen. By pressin keys on the keyboard you can move the cursor to highlight (point to) a item in a menu. It is even easier than it sounds. The following picture is typical VisiTrend/VisiPlot menu; the BAR option is highlighted by th cursor.



The VisiTrend/VisiPlot program draws the six different kinds of cha that were pictured earlier:

- Line charts, which consist of points plotted against a value axis and time axis. The points can be connected by a line or can be plott without the connecting line.
- Bar charts, which consist of vertical bars that show value by the height.
- Area charts, which are line charts with the area between the plotti line and the base line filled in.
- Pie charts, which show percentage of a whole or total with segments a circle.
- Hi-Lo charts, which show a range of values at a specific time with vertical line.
- Scatter charts, which show two sets of values plotted against each oth giving a graphic indication that there is or is not a correlation betwe the two sets.

The VisiTrend/VisiPlot software contains three programs, one th handles storage management and data editing, one that performs stati cal analysis, data editing, and computer memory management, and o

that plots charts of the data managed and generated by the other pro grams. The combined programs are too large to fit into the compute memory along with the time data series. You can freely switch betwee the programs, knowing the data that you have in memory is safely kept i memory when you change programs.

The Storage Management program loads data from diskette, saves dat on diskette, lists the data currently in memory, controls the assignmen of disk drives, clears unwanted data from memory, and provides th means of entering new data and modifying the existing data.

The Storage Management section also provides the means of loadin the plotting program. When you initially load the VisiTrend/VisiPlot pro gram, operation begins in the Storage Management section; you have t load data from diskette or create new data before drawing charts.

SOME DEFINITIONS

This manual uses some terms that might be new to you or that you us in a different way. It is important that you and the book always mean th same thing; it will save you time and frustration.

CHART

The output of the plotting program. The graphic representation of on or more data series.

COMMAND

An order given to the computer program. In the VisiTrend/VisiPlo program, commands are issued by selecting a menu item.

CURSOR

An area on the screen used to point to items in menus and lists. Th cursor is controlled with the right and left arrow keys and the space ba in menus and by the right and left arrow key in lists. The cursor is a whit area on the screen. When the cursor is pointing to an item, the item i displayed in dark letters against the white background.

DATA POINT

A numeric value that is associated with a date. The value is plotte against the Y-axis and the date against the X-axis. Data points, alon with their associated date, make up a series.

DATE

A value indicating a year or point within a year. A date is associate with every data point.

FILE

A collection of data on a floppy diskette. A file can contain from 1 to 1 series.

FUNCTION

The operation or processing the program does in response to command.

GRID

Horizontal and vertical lines on a chart used as an aid in determinin the value of a point or bars. In the VisiTrend/VisiPlot charts, grid lin are series of small dots, light against a dark background and dark again a light background.

LEAST SQUARES

See Linear Multiple Regression.

LINEAR MULTIPLE REGRESSION

A method of developing an equation that relates a dependent variabl such as a company's sales, to one or more independent variables, such a inventory, economic indexes, competition, etc., which should explain th dependent variable. The method produces an equation consisting of constant and independent coefficients that reproduce historical data wi the smallest error.

LIST

A display that offers a collection of data items, one or more of whic are selected with the cursor, the space bar, and the RETURN key.

MENU

A display that offers two or more command choices. The choices in menu are selected with the cursor and the RETURN key.

MOVING AVERAGE

An average taken over a specified number of points in a series. A seri made up of moving averages may illustrate trends that are obscured b erratic peaks or valleys in the data.

PERIOD or PERIODICITY

The frequency at which data points occur within a year. A period o one means the data is shown on a yearly basis. A period of 12 means th data is shown on a monthly basis. This manual uses the word period.

POINT

See Data Point.

RANGE

The period of time covered by a series or the scope of the series. Th range is the beginning date (and period) to the ending date (and period)

SCALE

The scope of values covered by the Y-axis of a chart. A scale usually but not always, covers the highest and lowest values in a series.

SERIES

A collection of data points in sequence, usually time. A series is th basic unit of data that the VisiTrend/VisiPlot program uses in memory A series has a name. On diskette, one or more series, to a maximum of 16 are stored in files.

SINGLE EXPONENTIAL SMOOTHING

A forecasting technique to show trends in a data series by generatin a new series by giving preference to the current data and forecast.

TIME SERIES

See Series.

X-AXIS

The horizontal axis of a chart. VisiTrend/VisiPlot plots the date on th X-axis (except on scatter charts).

Y-AXIS

The vertical axis of a chart. VisiTrend/VisiPlot plots the data poin values on the Y-axis.

APPLE COMPUTER REQUIREMENTS

To use the VisiTrend/VisiPlot program your computer must have:

- 48K or more of RAM memory.
- A video monitor or a TV set. The video monitor is preferable. The display device can be color or black and white. The color capability is preferable; it lets you make full use of the VisiTrend/VisiPlot color capabilities.
- One or more Apple Disk II disk drives. The disk controller must have the 16-sector PROMs installed. (The 16-sector PROMs come with the Apple Language System and with the Apple DOS 3.3.) You should have at least one blank diskette to begin.
- The Apple Language System card or the Applesoft ROM if your system is an Apple II. Applesoft Basic is in ROM if your system is an Apple II Plus.
- The VisiTrend/VisiPlot program diskette. This diskette is in the inside front cover pocket of the binder containing this manual.

SETTING UP YOUR APPLE COMPUTER

If you are using your Apple for the first time, be sure to follow the Appl instructions on how to set up the computer.

The computer power cord should be plugged into the back of the Appl and into a wall socket. Likewise, the video monitor or television powe cord should be plugged in.

If you have a video monitor, the dealer should have supplied you with cable to connect it to your Apple II. The monitor instruction manual or th dealer can supply the information about the setting of any switches on th unit. Make sure the cable is plugged into the jack labeled VIDEO OU on the back of your computer. The input to the monitor is probably labele VIDEO INPUT or something similar. If you have difficulty identifying th input, see your dealer.

If you use a television set, you need an RF Modulator and cable. Th device changes the signal put out by the Apple so that it matches what th television expects. Ask your dealer for an RF Modulator, or see your App BASIC or APPLESOFT manual for information on where to obtain one.

Your Disk II drive should be connected by a ribbon cable to the co nector labeled Drive 1 on the Disk II controller card. If you have two di drives, the second should be connected to the connector labeled Drive

The controller card should be plugged into the slot numbered 6 at t back of the Apple main circuit board inside the computer. This is a ve sensitive step; ask your dealer to show you how to install the drive a controller card properly.

If you have two or more controller cards, they must be plugged ir consecutive slot numbers to be used with the VisiTrend/VisiPlot progra The Drive 1 connected to the controller card in the highest slot numb must be used to load the program. For example, if you have disk control cards in slots 5 and 6, you must load the program from the Drive 1 whi is connected to the controller in slot 6.

Take time now to read Chapter 1, "Installation and Handling" of T DOS Manual.

IF YOU HAVE TROUBLE

If you have any trouble at any point in the set up, see your Apple deal Don't try to load VisiTrend/VisiPlot until the computer is set up a operational.

THE VISITREND/VISIPLOT PROGRAM DISKETTE

Your copy of the VisiTrend/VisiPlot program comes on the diskette the pocket of the VisiTrend/VisiPlot binder. This diskette cannot copied. See the "Warranty Policy for Productivity Series Software" cc in the binder for replacement information.

THE PROGRAM DISKETTE SERIAL NUMBER

The VisiTrend/VisiPlot program diskette serial number is recorded the diskette. You must get the serial number to complete your warra card. It is advisable to also write the number down in a place where y can find it.

To read the number:

1. With the computer power OFF, insert your Apple DOS 3.3 Syst Master diskette into Drive 1. Turn the power ON.
2. Insert your VisiTrend/VisiPlot program diskette into Drive 2. If y have only one drive, remove the System Master diskette and repl it with the program diskette.

3. Issue the DOS 3.3 CATALOG command:

   CATALOG,D2 (if the program diskette is in Drive 2)

   CATALOG (if the program diskette is in Drive 1)

4. The program diskette serial number is contained in the name of the first file on the program diskette. The name is SERIAL-NUMBER xxxxxxxxxx where xxxxxxxxxx is the 10 digit serial number.

0119081735

CARE OF DISKETTES

Your diskettes are small plastic disks coated with magnetic material on which data can be stored. The diskettes are permanently sealed in a square cover for protection. The cover keeps it clean and yet, allows it to spin freely. This protective cover is never opened.

Never let anything touch the brown or gray surface of the diskette. Handle the diskette only by the plastic cover. When a diskette is not being used, keep it in the paper pocket in which it came. These pockets are treated to minimize static buildup which attracts dust. It is best to store your diskettes in a vertical position, in their box, a diskette holder, or notebook specially designed for them.

Diskettes hold a large amount of information. The information is stored in bits which occupy a very small area of the diskette. An invisible scratch on the surface of the diskette, even a fingerprint, can destroy data. Do not put diskettes on dirty or greasy surfaces; do not let them collect dust.

When writing on a diskette label, use a felt tip pen. Do not press hard. It is best not to write on a label attached to a diskette. Write on the label and then put it on the diskette.

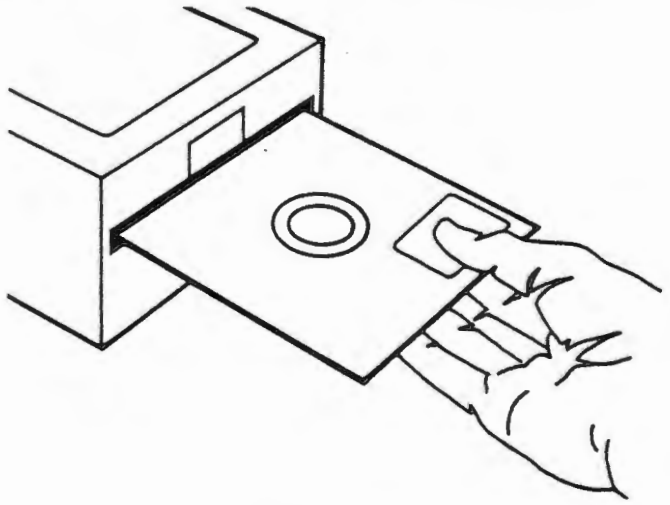
Keep your diskettes away from magnetic fields. This means keep them away from magnets, electric motors, and television sets.

Diskettes are sensitive to temperature extremes. Keep them out of the sun and away from heat sources that can warp them and cause data loss. On hot days, car trunks and dashboards can destroy diskettes. Diskettes operate satisfactorily up to 52 degrees Celsius (approximately 125 degrees Fahrenheit). The first indication of heat damage is a warped or bent plastic cover.

With reasonable care a diskette will give you an average life of 4 operational hours, which is a long time when you consider the short time it takes to load most programs. But just a little bit of carelessness can destroy its usefulness.

INSERTING AND REMOVING DISKETTES

A disk drive door is opened by pulling outward and upward on the bottom edge of the door. The diskette is slipped into the slot with the label facing upward as shown in the illustration. The edge of the diskette with the oval cutout should enter the drive first; the edge with the label should enter face up and last.



001-001

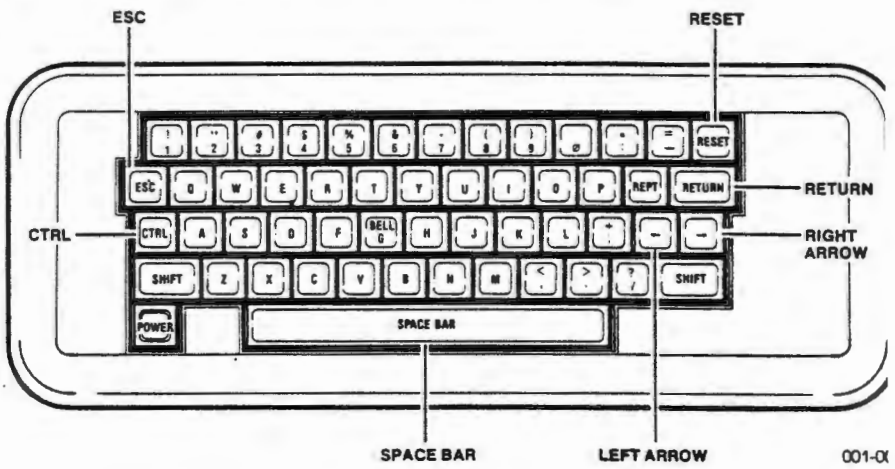
Push the diskette gently into the drive. Do not bend it. When it is totally in the drive, close the drive door by pushing it down. The two metal fingers that can be seen inside the slot as the door is closed should clear the diskette.

To remove a diskette, open the door and pull the diskette straight out of the slot. Opening the drive door lifts the read/write head from the diskette surface. If you leave a diskette in a drive for long periods without use, it is a good idea to open the door so the read/write head does not rest on the diskette.

Never remove a diskette while the IN USE light on the drive is lit. This can permanently damage the diskette and is almost certain to destroy the information on it. You may be able to reuse such a diskette but will not be able to recover the lost data.

THE KEYBOARD

The figure shows the Apple II keyboard. You will use all the keys wit the VisiTrend/VisiPlot program. There are certain keys that are used ver often and one you should not use. They are pointed out in the figure. Thes keys, with the exception of the RESET key, are explained in the lesson: The RESET key is discussed in the following section. For now it is impoi tant that you know their names and locations on the keyboard.



The Reset Key

NEVER PRESS THE RESET KEY.

If you are a beginner to the VisiTrend/VisiPlot program, some of the following may not be meaningful to you right now. Please read this sec tion now even if it is not completely clear. Because of its location on the keyboard, it is easy to press the RESET key accidentally. This section tell: you what to do if the program is not able to handle an accidental pressing of the RESET key.

The RESET key is very different than the other keys on the keyboard If you press it accidentally and you have an Autostart ROM installed i your computer, the VisiTrend/VisiPlot program almost always recovers by taking you to the main menu of the program you are currently using Any action that was in progress, such as drawing a chart, is canceled.

If you press RESET, while saving data to a diskette, you will very likel destroy the file.

If your computer does not have an Autostart ROM installed, pressing RESET will put you in the system monitor. The system monitor displays an asterisk (*) prompt. If this happens, do the following:

1. Type 3D0G and press the RETURN key.
2. If the menu was at the top of the screen, that is if you were in the Storage Management program or the VisiTrend program, type GOTO 1000 and press the RETURN key. If the menu was at the bottom of the screen, that is if you were in the plotting program, type GOTO 205 and press the RETURN key. The GOTO statement should be typed when the Applesoft prompt (]) is displayed at the left side o the screen.
3. If this does not put you back into the correct VisiTrend/VisiPlot pro gram, you must reload the program. DO NOT TYPE RUN TC RECOVER WHEN YOU ARE IN BASIC.

The CTRL-C Key

The CTRL-C signal is generated by pressing and holding the CTR key and then pressing the C key. The CTRL-C stops graphic displa operations; it should not be used for other purposes. Its purpose is to sto the plotting of a large series which you started by mistake. Do not pre the CTRL-C while a disk drive is operating; it may cause an error th could destroy a file or all the data on the diskette.

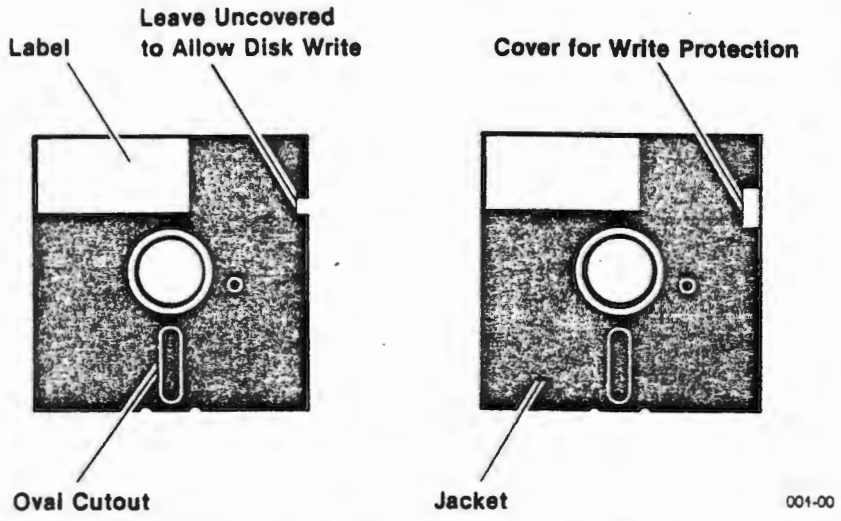
PRINTER SUPPORT

As noted earlier, the VisiTrend/VisiPlot program supports sever different graphic printers. Appendix B contains a list of the supporte printers with the required options and switch settings where applicable. also contains a list of the graphic printers and interface cards that are n currently supported by the VisiTrend/VisiPlot program.

The VisiTrend/VisiPlot program diskette you received is configured the print on the Apple Silentype™ printer. If you use an Apple Silenty printer or do not have a printer connected to the computer, you do n have to make any changes and can skip the remainder of this section a go on to "Loading the VisiTrend/VisiPlot Program."

Each printer requires a different driver program to correctly reprodu your charts. These driver programs are on your VisiTrend/VisiPlot p gram diskette. The name of the driver programs that support each prin are listed in Appendix B.

If you do not use an Apple Silentype printer, you must change the name of two files on your program diskette. Before you can change anything on the diskette, you must remove the write-disable tab. The write-disable tab is on the right upper side of the diskette as shown in the following figure.



Carefully remove this tab. Be very careful not to bend the diskette. I you do not have spare tabs, keep this one; it must be replaced later. D the following after you remove the tab:

1. Put your Apple DOS 3.3 System Master diskette into the disk driv and turn the system ON.
2. Put your VisiTrend/VisiPlot program diskette into the second dis drive. If you have only one disk drive, remove the DOS 3.3 Syster Master diskette and put the program diskette in that drive. Th remaining steps assume you are using two disk drives. If you ar using one drive, enter D1 each time the example shows D2.
3. Issue the following DOS 3.3 command:

   RENAME VISIPLOT.DRIVER, SILENTYPE.D, D2
4. Next rename the driver program for your printer (shown as xxxxx.I —the driver names are in Appendix B) to VISIPLOT.DRIVER:

   RENAME xxxxx.D, VISIPLOT.DRIVER, D2
5. Remove the VisiTrend/VisiPlot program diskette from the disk driv and replace the write-disable tab.

LOADING THE VISITREND/VISIPLOT PROGRAM

The procedure to load the VisiTrend/VisiPlot program depends on the configuration of your Apple II or Apple II PLUS. Use the procedure for your configuration. The 16-sector PROMs must be installed in the disk controller card.

Procedure 1 must be used on Apple II PLUS computers with or without the Language System and on Apple II computers with the Applesoft ROM installed. These systems have Applesoft Basic in the system.

Procedure 2 must be used on Apple II computers with the Language System installed but without Applesoft in ROM. Applesoft Basic must first be loaded into these systems.

Procedure 1

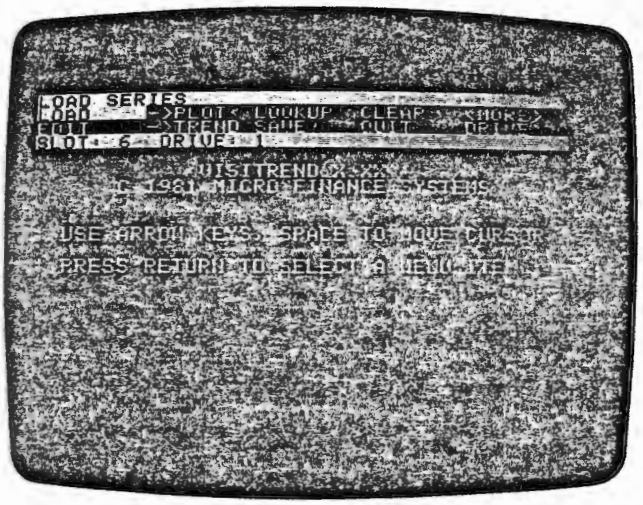
1. With the computer power turned OFF, put the VisiTrend/VisiPlot diskette in Drive 1 and close the door. If you have a second drive, it should be empty at this time. If you have multiple disk controller cards, use the Drive 1 that is connected to the controller card that is plugged into the highest numbered slot. This is usually slot number 6.
2. The display unit (monitor or TV set) should already be turned ON. Turn the computer power switch (located on the back left of the computer) ON. The red IN USE light on the disk drive lights and the drive begins to run. In less than one minute you will see the VisiTrend/VisiPlot startup display on the screen.

Procedure 2

1. With the computer power turned OFF, put the DOS 3.3 System Master diskette in Drive 1 and close the door. If you have a second drive, it should be empty at this time. If you have multiple disk controller cards use the Drive 1 that is connected to the controller card that is plugged into the highest numbered slot. This is usually slot number 6.
2. The display unit (monitor or TV set) should already be turned ON. Turn the computer power switch (located on the back left of the computer) ON. The red IN USE light on the disk drive lights and the drive begins to run. In a short time, Applesoft Basic will be loaded into the computer and the Integer Basic prompt (>) is displayed.
3. Open the drive door and remove the DOS 3.3 System Master diskette.
4. Insert the VisiTrend/VisiPlot program diskette into Drive 1 and close the door.
5. Type RUN INIT and press the RETURN key. The red IN USE light on the disk drive lights and the drive begins to run. In less than one minute you will see the VisiTrend/VisiPlot startup display on the screen.

THE VISITREND/VISIPLOT STARTUP DISPLAY

The photo shows the initial display after loading the VisiTrend/VisiPlot program.



The four lines at the top of the screen—one light, two dark, and one light—are called the status area. The status area gives you information about the computer and program and contains the menus of the commands you can give to the VisiTrend/VisiPlot program.

The reverse video lines (the top and bottom lines) supply information or give direction. The normal video lines (the two middle lines) display a menu, messages from the program, or provide a space for data entry.

Below the status area are two lines that contain the version number of the VisiTrend/VisiPlot program that you loaded and the copyright notice. If you do not have the version number written down, do it now. You will need it in the event you ever have trouble with the program. The copyright notice shows that the program on this diskette is protected by the United States Copyright laws. Be sure to read the notice inside the front cover about the copyright protection of this program and manual.

Under the copyright notice there are two lines of directions on how to select an item from the menu.

THE VISITREND/VISIPLOT CURSOR

Look at the menu lines in the status area, notice that one item is shown in reverse video (black on white). If you just loaded the program and have not pressed any keys, that item is LOAD.

Press the right arrow key on the keyboard. The reverse video area moves to the word −>PLOT. The reverse video area in the menu is called the cursor. Pressing the arrow keys moves it in the direction indicated. Press the left arrow key and the cursor moves back to LOAD.

As you move the cursor, the top line of the status area changes. With the cursor pointing to LOAD, the top line reads LOAD SERIES and with the cursor pointing to −>PLOT, it reads GO TO VISIPLOT. The information in the top line is called the Long Prompt. It gives a longer description of the menu item to which the cursor is pointing.

There are two menu lines. With the right arrow key, move the cursor to the right end of the top line, to <MORE>. Now press the right arrow key once more. The cursor jumps to the left end of the bottom line. This cursor action is called wraparound.

Cursor wraparound works in both directions. Press the left arrow key and the cursor jumps back to the right end of the top line. From the right end of the second line it jumps to the left end of the top line.

It is inconvenient to move the cursor across the whole menu line to reach the other line. With the cursor on LOAD, press the space bar. The cursor moves down, directly to the bottom line, to EDIT. Press the space bar again and the cursor moves back up to the top line.

The use of the space bar and the arrow keys makes cursor movement very easy and convenient.

SELECTING A MENU ITEM

Moving the cursor to a menu item causes no action to take place. To select a menu item, you must move the cursor to the item and then press the RETURN key.

Move the cursor to LOOKUP and press the RETURN key. The message NO ACTIVE SERIES! appears in the status area, replacing the menu and there is a beep from the computer signalling that an abnormal situation occurred. In this case, you selected a function that displays a list of the plotting data currently in memory. The program could not do this because there is no plotting data in memory.

However, something more important than an error happened. You lost the menu and cannot do anything. The program is menu-driven, which means all commands are issued by selection from a menu. You must have a menu on the screen if you are to do anything. When you reach this situation—no menu on the screen—press any key on the keyboard except the RESET key. Pressing keys such as SHIFT and CTRL have no effect because they are always used in conjunction with another key. But pressing any other key erases the message in the status area and redisplays the menu.

It is important to remember: ANYTIME YOU SEEM TO BE AT A DEAD END WITH NO WAY TO CONTINUE, PRESS ANY KEY EXCEPT RESET, SHIFT, OR CTRL.

MORE ABOUT THE STATUS AREA

The bottom line of the status area lists a Slot and Drive number. This is the Slot and Drive address for the diskette that the program uses to load and save plotting data. If you have a single drive system, the line should indicate Slot 6 and Drive 1. (Slot 6 is the normal slot used for a single disk controller.) If you have only one drive, it must be plugged into the Drive 1 connection on the controller board.

If you have more than one drive, you can choose which drive is used for data. This is covered in Lesson Three.

MORE ABOUT THE CURSOR

With the arrow keys and/or space bar move the cursor to LOAD and press the RETURN key. The disk drive starts running and the message READING DIRECTORY... appears in the status area. The drive stops and a list of names is displayed below the status area. This is a list of files on the VisiTrend/VisiPlot program diskette containing data that can be plotted. These sample files are supplied as part of the lessons in this manual. The data in these files is fictional; it does not represent any actual condition or circumstance.

All you are going to do with this list now is to learn how the cursor works in a list.

The cursor has moved from the status area to the top item of the list. Press the right arrow key. The cursor moves to the next item down the list. Press the left arrow key and the cursor moves back up to the first item.

Press the right arrow key until the cursor reaches the bottom item whi is (NONE). Now press the right arrow key once more. The cursor jum back to the top of the list. Wraparound works on the list as well as t menu. Now press the left arrow key to see if the cursor wraparound al works from top to bottom. It does.

This is a list you will use in Lesson One to load data from the diske into the computer memory. For now we don't want any data. To select item from the list, press the RETURN key with the cursor on the desir item. For now move the cursor to (NONE) and press the RETURN key. T list vanishes and the menu returns to the status area.

SUMMARY

Now you are ready to go on to the VisiTrend/VisiPlot lessons. Less One is about drawing charts on the screen. Lesson Two covers the Stora Management program except for the Edit functions. The Edit functio are covered in Lesson Three. Lesson Four describes how to use the statis cal analysis functions in the VisiTrend program. In Lesson Five, you w return to plotting and learn to do some of the more complex charts.

LESSON ONE

THE BASIC USE OF THE VISITREND™/VISIPLOT™ PROGRAM

If you have not read the Introduction, do so before continuing; it contains the basic information that this lesson assumes you already know. It tells you how to load the VisiTrend/VisiPlot program, what the cursor is, how to move the cursor, and more.

This lesson assumes you know:

- How to load the VisiTrend/VisiPlot program from diskette.
- How to move the cursor in a menu and in a list.
- How to select an item from a menu and a list.

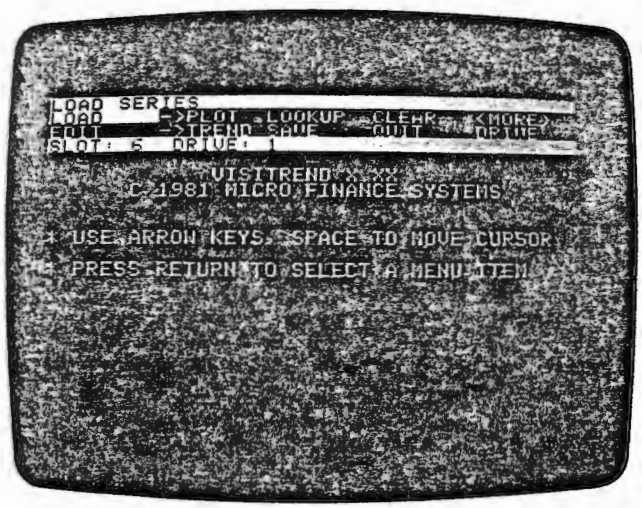
If you are not sure how to perform any of these functions, reread the sections of the Introduction that describe them.

This lesson introduces some of the major functions you encounter using the VisiTrend/VisiPlot program. This lesson deals almost totally with the Plot program. You are given instructions on how to load some plotting data and how to get to the Plot program. There are no explanations of these directions in this lesson; they are explained in Lesson Two.

LOADING THE PROGRAM

Load the VisiTrend/VisiPlot program according to the directions in the section "Loading the VisiTrend/VisiPlot Program." For the purpose of this lesson, do not put a diskette in Drive 2 if you have a multiple drive system. Leave the Drive 2 door open.

When the program is loaded the display should look like the following photograph. If it does not look like this, go back to the Introduction and start over.



If the bottom line of the status area reads DRIVE: 2 instead of DRIVE: 1, load the program again without a diskette in Drive 2.

The Storage Management program is now loaded; this program is the subject of Lesson Two. For now we want to load some data that can be plotted, load the Plot program, and draw some charts on the screen. Press the following keys in the order listed:

(make sure the cursor is on the word LOAD)

RETURN (wait for the disk drive to stop running and make sure the cursor is on SAMPLE 1)

RETURN (again wait for the drive to stop, a list of the data series in SAMPLE 1 is displayed)

RETURN (the list disappears and the menu returns)

Right Arrow (move the cursor to ->PLOT)

RETURN

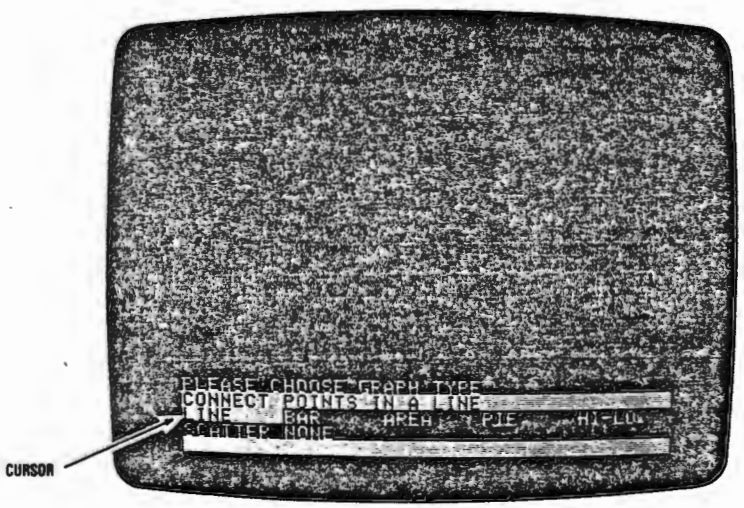
At this point, the message TYPE Y TO CONFIRM should be displayed in the status area. If this message is not displayed, move the cursor to the word LOAD and repeat the preceding sequence. If there is no menu, press any key except RESET.

If you have the correct message, press the Y key on the keyboard. The VisiTrend/VisiPlot program gives you this chance to verify that you want to change programs. Pressing any other key cancels the loading of the Plot program.

If you accidentally pressed the wrong key, move the cursor to the word ->PLOT and press the RETURN key again.

After you press the Y key, the disk drive runs for a short while. When it stops, the TYPE Y message is replaced with ONE MOMENT PLEASE... At this point, the program is initializing itself. In a short time the disk drive begins again and the message GETTING PLOT PROGRAM... replaces the request to wait a moment. The disk drive stops and the screen goes blank for a moment.

The line PLEASE CHOOSE GRAPH TYPE appears near the bottom of the screen. A new status area appears under the line. You are now in the Plot program. The screen looks like the following photograph.



In the Plot program, the status area is at the bottom of the screen. This allows a chart to be displayed along with the status area without destroying any of the chart. The status area covers up the bottom titles and the chart legend but you can turn the status area display on and off at will when a chart is displayed. More about this later.

THE SELECT MENU

The menu in the status area is the Select menu. You use it to select the type of chart you want to draw and the series. The menu items indicate the six kinds of VisiTrend/VisiPlot charts: LINE, BAR, AREA, PIE, HI-LO, and SCATTER. The last item on the menu, NONE, provides a way to exit from this menu without choosing a chart type. This exit path comes in handy at times, especially after you get to this menu by mistake, which can happen when you become very familiar with the menus and start using them very fast.

Move the cursor around within the menu. Read the long prompts in the top line of the status area. They explain each choice in a little greater detail. For example, when the cursor points to LINE, the long prompt says CONNECT POINTS IN A LINE. The long prompts are an aid if you forget what a menu item does.

Move the cursor to LINE and press RETURN. You just elected to draw a line chart.

The menu disappears and is replaced with <—, —>, SPACE OR RETURN. A list of names appears at the top of the screen. This is the same list you saw after loading SAMPLE 1. This is a list of the data series that are currently in memory.

The list includes some information about each series. Going across the header line, the information items are:

NAME: This is the name of the data series. Series names should be descriptive; they should indicate what data they contain. The two series in this list contain some sales data and some historical data.

PER: This is the period of the series. Both series in the list have a period of 1. This means there is one data point for each time period that the series covers. The period can be any value from 1 (annual) to 99. Typical values are 1 (annual), 4 (quarterly), 12 (monthly), and 30 (daily).

START: This is the starting date for the series. The first data item is for the year 1973 in both of the listed series. If the period was something other than 1, the starting date would include the year and the period of the first data point. For example, a starting date of 1980 9 with a period of 12 means the 9th period of 1980 or September, 1980.

END: This is the ending date for the series. Everything mentioned the description of START applies to END.

#: This is the number of data points in the series. A series c hold a maximum of 150 data points.

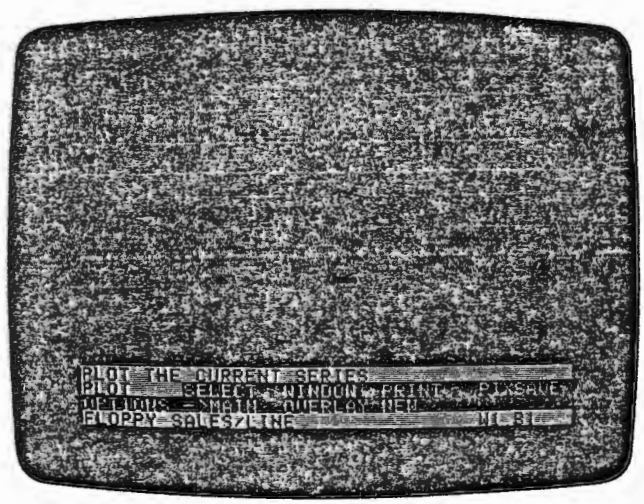
You must select a series from this list. You cannot go further in the P program unless there is data to plot. Selecting an item from a list is much different than selecting from a menu. You simply move the cur to the item and press the RETURN key.

Play with the cursor in this list. Note that the right arrow key moves cursor down the list and the left arrow key moves it up the list. Also n that the cursor wraps around the list. If you try to go beyond the bott line of the list, the cursor jumps to the top item. Likewise, attempting to beyond the top of the list causes it to jump to the bottom. The wraparou feature lets you move around a long list very rapidly.

For the purposes of this lesson, move the cursor to the series nam FLOPPY SALES. Press RETURN.

THE MAIN PLOT MENU

The list of series is erased and a new menu appears in the status area the bottom of the screen. This is the Main Plot menu. Most of your wo with the Plot program is done from this menu.



Look at the status area; there are a couple of new items in it. The bottom line, which was blank in the previous menu, now says FLOPPY SALES/LINE on the left side and W1.B1 on the right side.

You probably remember that the items on the left side repeat the selections you made from the last menu and list. You chose to draw a LINE chart and selected the series named FLOPPY SALES.

The meaning of the cryptic notation on the right is quite simple, it specifies the colors in which the chart will be drawn. W1 says the foreground o the chart, the actual data, will be drawn in white. B1 says the backgroun will be black. You can change the colors and will have a chance to do i later. The program always puts a single series chart in black and white The program does not know if you have a color or black-and-white moni tor. Black and white shows up very well in both types of monitors.

The cursor is pointing to the word PLOT and the top line of the statu area says PLOT THE CURRENT SERIES. The current series is the last serie or group of series chosen from the list. Selecting a series makes that serie the current series. You can select more than one series and then they a become the current series. Selecting multiple series is described in Lesso Five.

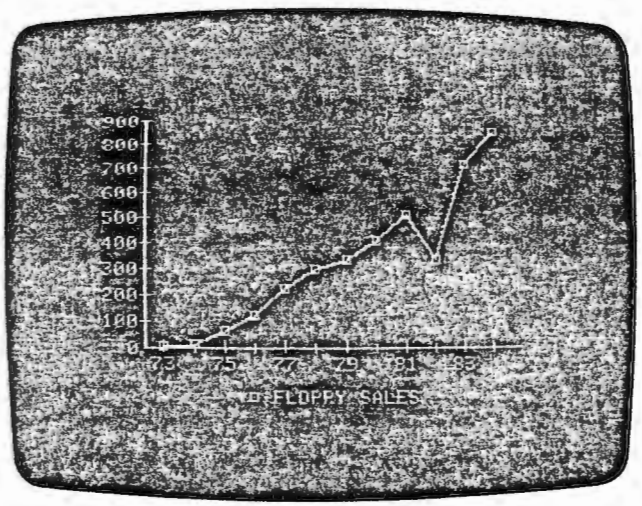
Move the cursor around the menu and read the long prompts for th other items. Don't press RETURN yet. When you are done looking ove the Main menu, move the cursor back to the word PLOT.

DRAWING THE CHART

With the cursor on PLOT, press RETURN. As the long prompt says, th function draws a chart of the current series.

When you select PLOT, the menu in the status area is replaced wit SCALING... In a few moments SCALING... is replaced with PLEASE WAIT. You also hear a sound from the computer. The beep is just an adde indication that the computer got your command and is processing There is another beep when it completes the chart.

The Plot program draws the outline of the chart, the Y-axis and t X-axis, and puts the values at the tick marks. At this point the status ar disappears and the data is plotted within the chart. Finally, the legend printed across the bottom and the second beep indicates that the PL request is completed. The screen should now look like the followi photograph.



Examine the chart. The numbers along the vertical or Y-axis are th scale of the chart. The numbers along the horizontal or X-axis are th range. Remember that the series listing said this series covered the yea 1973 through 1984. The numbers along the X-axis are 73, 75, and s forth. When the range is given in years and there are many plottin points, the Plot program abbreviates the range numbers to fit on the axis.

The line under the X-axis is the legend. The legend contains the nam or names of the plotted series and, in the case of line charts, shows wh plotting symbol is used for a particular series. A square box with a d in the center is always used when a single series is plotted. Later, whe you draw charts with multiple series, you will see the other symbols: th diamond and the pound sign.

The main attraction of the chart is the plotted data. There is a plottin symbol for each of the 12 data points in the series. The points are co nected by a line.

HOW TO CONTINUE

Up to this point, there has been a menu on the screen or some directio telling you what you can do. With the menu you always knew you cou do something. Now there is nothing but a chart; there isn't even a cursc Of course you do not want to stop after making a single chart. Th VisiTrend/VisiPlot programs are menu driven and you cannot do muc without a menu. To get the menu back, press any key on the keyboa except RESET.

No matter what you press, the status area reappears and covers the legend. The full chart is still visible above the status area. The status area contains the same menu you used to draw the chart, the Main Plot menu.

If you want to see the chart again without the status area, press the ESC key. The status area is erased and the chart legend reappears. You can switch back and forth as often as you want. Any key brings the status area back and the ESC key erases it. These functions work whenever there is a chart on the screen.

DRAWING A BAR CHART

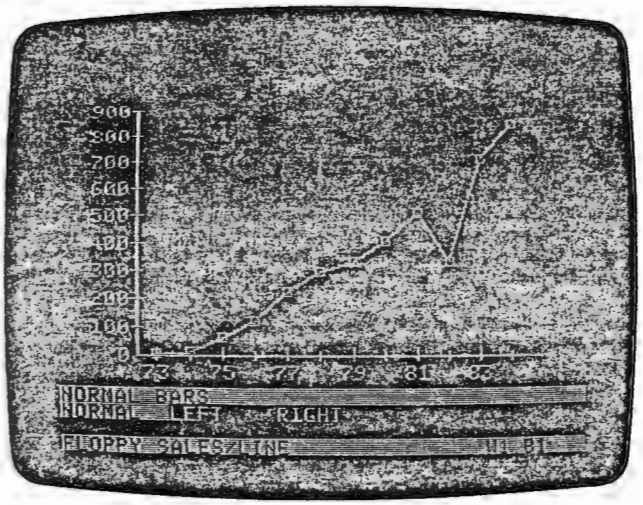
If the status area is not on the screen, display it by pressing any key except RESET. There are many things you can do to the chart with the other functions in the Main Plot menu. You can put titles on it, change the range and scale, put grid lines on it, and much more. Before looking at these features, you should practice what you just learned by drawing a different kind of chart. You are going to start over and repeat what you did to draw the line chart. The difference is that you are going to draw a bar chart.

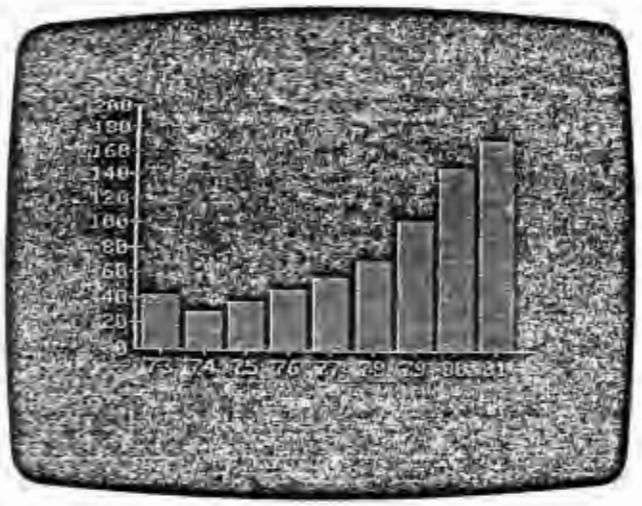
Move the cursor to the word SELECT. The long prompt says SELECT A GRAPH BY TYPE. Press RETURN.

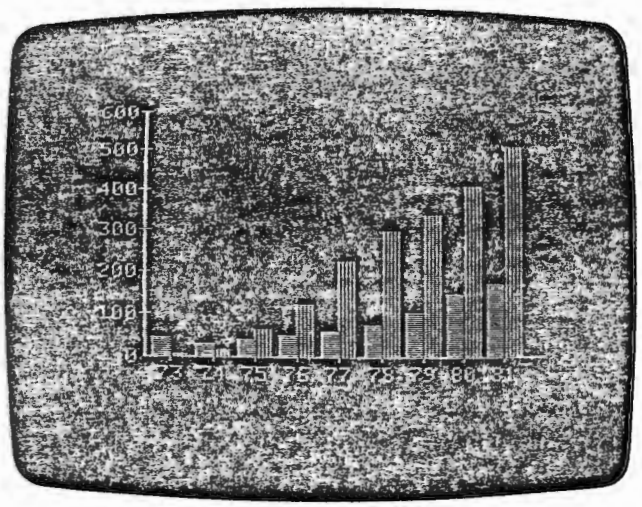
As you probably expected, the status area changed and the Select menu is displayed. The line chart is still on the screen. You can still erase the status area with the ESC key to display the whole chart and legend.

Move the cursor to BAR. The long prompt says DRAW VERTICAL BARS. Press RETURN.

Instead of the list of series, the status area changes and the Bar menu appears. Here you have to select the style of bars with which you want the chart drawn. The choices are NORMAL, LEFT, and RIGHT. LEFT and RIGHT bars are half the width of the NORMAL bars and appear to the left or right of the tick marks. Make sure the cursor is on NORMAL and press RETURN. The normal, or full-width, bars are centered on the X-axis tick marks. The photographs show the Bar menu and the full- and half-width bars.


900
800
700
600
500
400
300
200
100
0
73 5 77 79 81
NORMAL BARS
NORMAL LEFT RIGHT
FLOPPY SALES/LINE


180
160
140
120
100
80
60
40
20
0
73 74 75 76 77 79 81

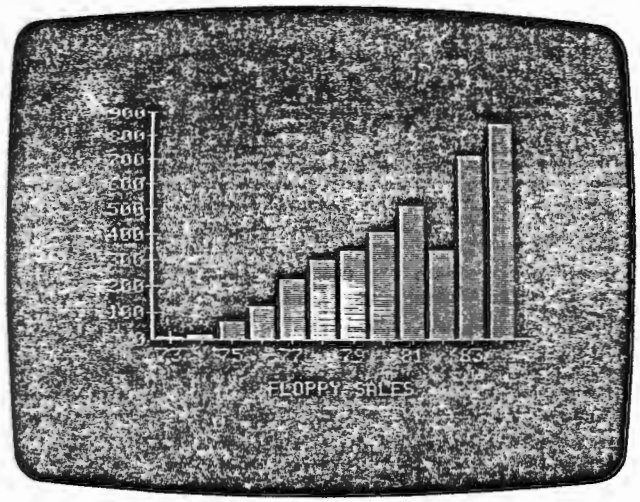


Now the list of data series is displayed. Again select FLOPPY SALES and press RETURN.

As before, the list is erased and the status area changes to the Main Plot menu. The last chart, the line chart of FLOPPY SALES is again displayed. The old chart is kept on the screen until you PLOT the new chart. Look at the bottom line of the status area, you will see that it now reads FLOPPY SALES/BAR.

Make sure the cursor is on PLOT and press RETURN.

The line chart is erased and the sequence you saw earlier is repeated: a sound from the computer, SCALING..., PLEASE WAIT..., the chart is drawn, and finally the sound indicating the chart is completed.

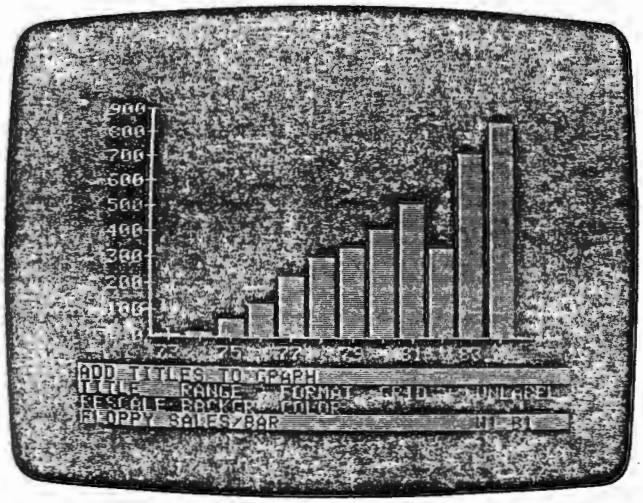


THE PLOTTING OPTIONS

The chart on the screen is quite Spartan. In some instances this cha would be perfect. But for most applications, you will want to include mo in the chart. You might want a title that is more descriptive than t legend. You might want to explain the values on the Y-axis. You mig want to highlight some detail in the chart or explain some detail such the drop in sales in 1982.

Press any key to display the status area.

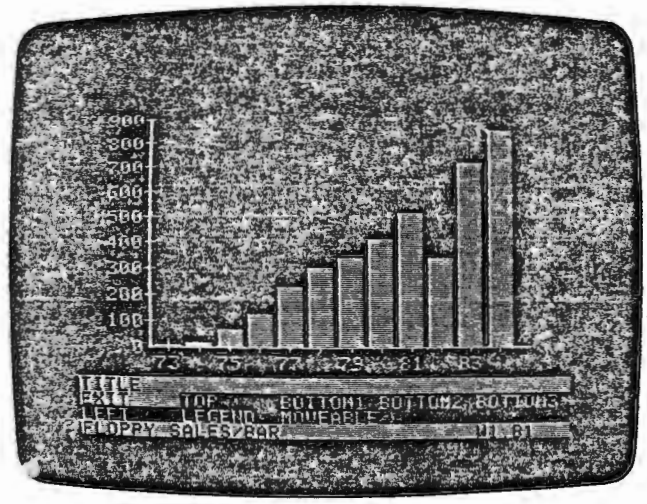
The menu item immediately under PLOT is OPTIONS. Move the curs to OPTIONS and press RETURN. The menu in the status area change This is the Options menu. You are going to use all of these options in t lesson.



Move the cursor around the menu and read the long prompts; they giv you a brief idea of what each option does. When you are done examinin the menu, move the cursor back to TITLE and press **RETURN**.

Putting Titles on a Chart

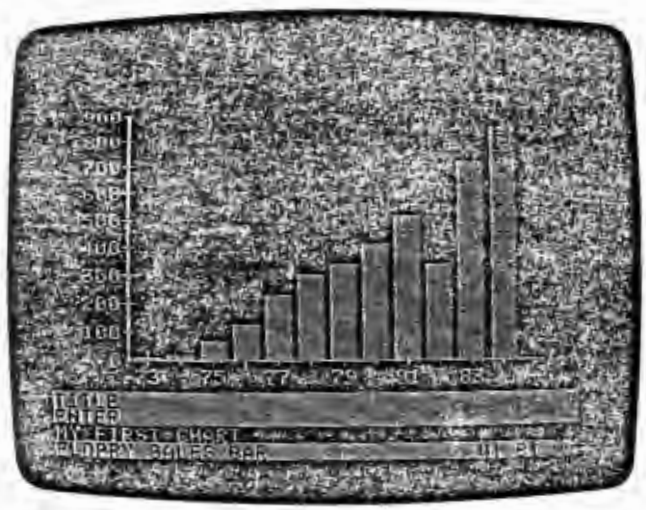
The status area again changes menus. This is the Title menu. Th menu does not display long prompts in the top line of the status area. Th items are descriptive and you won't have any trouble understandin them.



The first item is EXIT. EXIT provides the means of getting out of this menu The other items in the Title menu perform their function and then retur to the Title menu. EXIT returns you to the Main Plot menu, not to th Options menu. Give it try. To get back to the Title menu, you must selec OPTIONS and then TITLE.

Move the cursor to TOP and press RETURN.

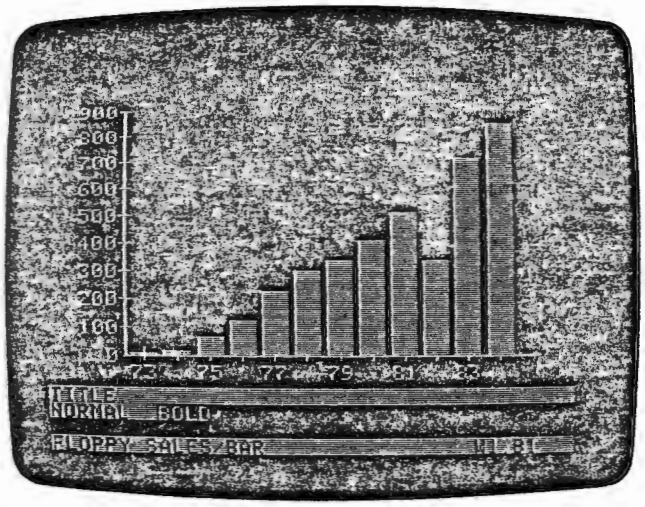
The status area changes. The menu vanishes and the second line cor tains the word ENTER. The third line is empty. This is a configuration yo will see often. It means the VisiTrend/VisiPlot program wants you to ente some data at the keyboard. The data you enter at the keyboard appears i the third status area line.



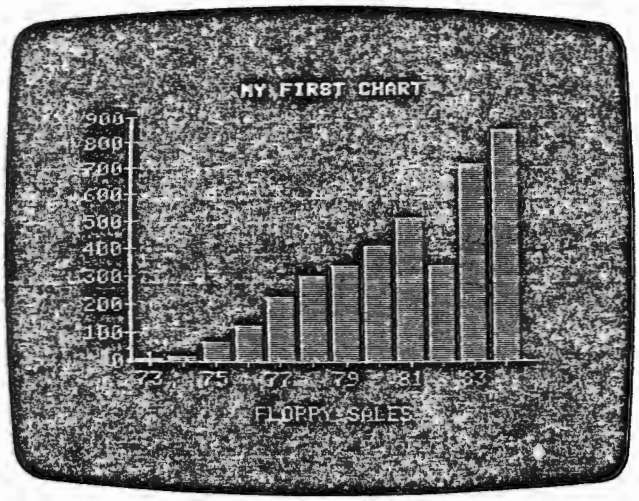
Type MY FIRST CHART. If you make a mistake, press the ESC k ESC erases the last character on the line. Press ESC. If the last charac was a space, you won't see anything happen. Press ESC until you see erasing action of the ESC key. If you press ESC past the beginning of data, the program returns to the Title menu.

Anytime you have to enter data, the ESC key lets you correct y mistakes or change your mind. If you try to correct the line by press the left arrow key, you will hear a beep from the computer indicat that the use of the key is not valid.

When you finish entering the title, press RETURN. A two item menu appears. You have the choice of displaying your title in normal typeface or bold typeface. Everything you have seen written on the screen so far has been in the normal typeface. Move the cursor to BOLD and press RETURN.



The title appears centered at the top of the chart. Notice that the characters are much bolder than the other characters on the screen which are in the normal typeface.



You can enter a top title as long as 38 characters. If you change yo mind and want a new top title, just enter a new one. The new title wi replace the old one.

The Title menu reappears at the bottom of the screen after the top titl is completed.

Notice that the menu allows you to enter one, two, or three botto titles. The bottom titles use the same area used by the legend. A botto title erases the legend line if there is a legend line at the specified locatio

Move the cursor to BOTTOM and press RETURN. Again you are cor fronted with the status area configuration that requests alphanumeri data. Bottom titles can also be 38 characters long. Enter the title DIS DRIVE SALES. When you press the RETURN key, the typeface men again appears. This time select the NORMAL typeface. After you selec the typeface, the legend line is overwritten by the title and quickly th status area reappears. Press the ESC key to erase the status area an take a better look at the bottom title. Press any key when you are read to continue with the lesson.

Move the cursor to LEFT and press RETURN. The Left title can be 1 characters long. Enter UNITS PER OUTLET. When you press RETURI the line is displayed vertically along the left side of the chart, outside th Y-axis scale values. The typeface menu was not displayed. The LEF title is only available in the normal typeface.

The last item in the Title menu is MOVEABLE. The MOVEABLE functio provides the means of entering a title and moving it to any location in th chart. With the MOVEABLE function you can put as many titles as yo want anywhere in the chart; there is no limit.

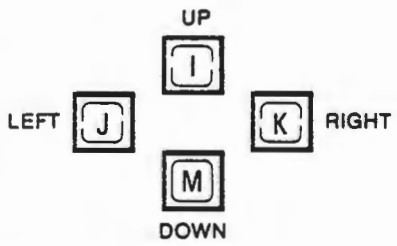
Move the cursor to MOVEABLE and press RETURN.

Enter PLANT FIRE and press RETURN.

The entry appears at the middle left of the plotting area and blinks at a steady rate. This title can now be moved to any location on the screen. I will continue to blink until it is fixed in a permanent location.

Moving a Title

The movement of a title is controlled with the I, J, K, and M keys. Loc at these keys on the keyboard and you will notice that their relative loc tions suggest the four screen directions:



001-

Press and release the K key and the blinking title slowly moves to th right. You can stop it at any time by pressing the space bar. Try it. To stc it moving again, press any direction key. While the title is moving, yc can change its direction by pressing a different direction key. There is r need to stop it to change direction. Press the M and let the title mo down over the chart bars. Notice that it is white when over a black bac ground and black when over a white background. Let it continue to th bottom of the screen. As it passes over numbers and letters, it is diffic to read. But you can always tell where it is by the blinking.

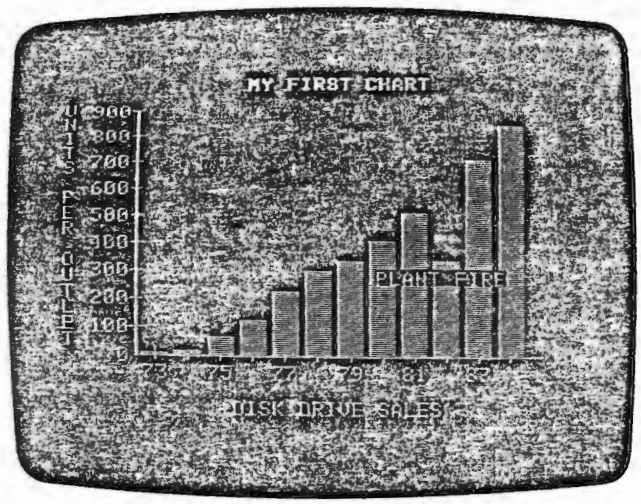
When it reaches the limits of the screen, it keeps trying to move and th computer beeps for each attempted move. The beeping continues un you stop the movement by pressing the space bar or change the directi by pressing another direction key.

You can increase the speed of the title movement with the number key 1 through 9. The higher the number the faster the title moves. If you d not choose a speed, it travels at the 1 rate.

Press 9, the fastest speed. The title continues in the direction it was mc ing but at a faster rate. If it was stopped, it begins moving again, in th direction it was last moving.

With a little practice, you will become adept at moving the title quick to an area of the screen at high speed and then fine tuning the position a slower speed.

Move the PLANT FIRE title to the short bar for the year 1982. Cent it across the bar about a quarter of an inch from the top. When you ha it where you want it, press RETURN to fix it in place.



When you press RETURN, the title stops blinking and appears in reve video, black letters on a white background. Press the space bar and t title changes, it is now in white letters on a black background. You c continue to switch back and forth between normal and reverse video pressing the space bar. When you decide on the style you prefer, pr RETURN again. The title is now a permanent part of the chart and t Title menu returns to the screen. The only way to change it now is redraw the chart.

Until you pressed the RETURN key the second time, the MOVEAE title could have been erased by pressing the ESC key.

You learned several things in this section:

- The I, J, K, and M keys move a moveable title in the direction indicat by their relative location.
- The number keys, 1 through 9, select the speed at which the ti moves.
- Pressing the RETURN key once fixes the title in its current location.
- The space bar switches the title between normal and reverse video.
- Pressing the RETURN key the second time makes the title a perm nent part of the chart and returns the Title menu.

Erasing Moveable Titles

A MOVEABLE title can be erased at any time by pressing the ESC key before the RETURN key is pressed the second time.

Enter another MOVEABLE title. Move the cursor to MOVEABLE, press RETURN, enter JUNK, and press RETURN again. Move the title to a location over the bars and stop it.

Now press ESC. The title vanishes and no harm is done to the bars that were under it.

You can erase the MOVEABLE title after it is fixed in place but before the second RETURN that makes it a permanent part of the chart. After the title is fixed in place (by the first RETURN), erasing it also destroys whatever is under it, that is, if part of the chart or other text is under the title, it is erased and a rectangular hole is left in the chart. To remove the hole you must rePLOT the chart.

After the second RETURN, the title cannot be erased.

Bringing Back the Legend

The only items remaining in the Title menu are BOTTOM2, BOTTOM3, and LEGEND. BOTTOM2 and BOTTOM3 function just like BOTTOM1 except that they put titles on different lines.

LEGEND erases any bottom title lines that cover legend lines and restores the original legend lines. Like bottom titles, there can be a maximum of three legend lines. Only those bottom title lines that covered a legend line are erased, the others remain on the screen. You covered the one line legend with the BOTTOM1 title. Press RETURN while the cursor is on the LEGEND item.

Very quickly the status area vanishes, the bottom title is erased, the legend line is restored, and the status area returns and covers the legend. This happens fast and you might miss it. Press the ESC key to erase the status area. Your bottom title is gone and the original legend is on the screen.

Just as a note now, it should be mentioned that the LEGEND function works differently with pie charts. When you have a pie chart on the screen, the LEGEND function erases the pie chart legend. After the pie chart legend is erased there is no way, short of redrawing the chart, to reconstruct it.

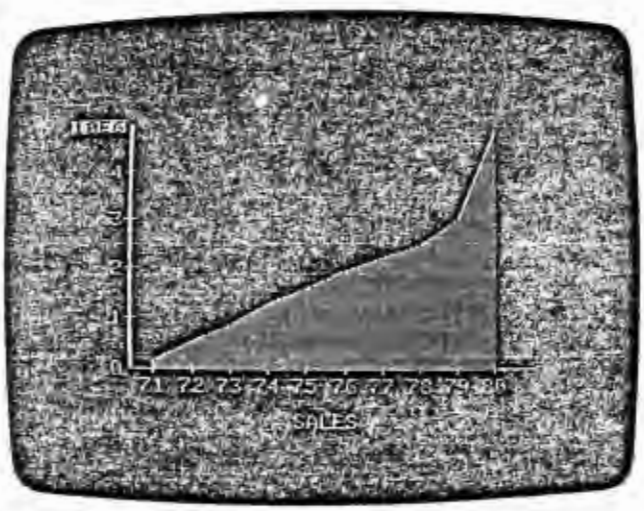
Move the cursor to EXIT and press RETURN to return to the Main Plot menu.

The Scale and the Range

The range of a chart is the time between the starting date and the enc ing date and is always plotted on the X-axis (except for a scatter chart The range is stored as part of the data series. The scale is the spread values plotted along the Y-axis. The program determines the scale eac time a series is plotted. It determines a reasonable-scale that covers th range of values in the series. It also decides on the number of divisior (tick marks) to display.

In determining a scale, the program attempts to avoid divisions th result in fractional or non-round numbers. When possible, it choose round numbers. For example, with a series that spans the values 0 throug 700, the program divides the Y-axis into seven divisions and labels the 0, 100, 200,..., 700. It wouldn't choose 11 divisions because that results i scale labels of 0, 63, 127, 190, 254, and so on.

When the Y-axis values are too large to be displayed, the VisiTrend VisiPlot program scales the values up or down by a power of 10. It the displays the Y-axis scaling factor at the top of the Y-axis in reverse vide (black on white). For example, with a scale of 0 through 100,000, the pr gram generates labels of 0, 10, 20, 30; these values are multiplied by 10 the 3rd power or 1000. The following photograph shows a chart with scale factor.

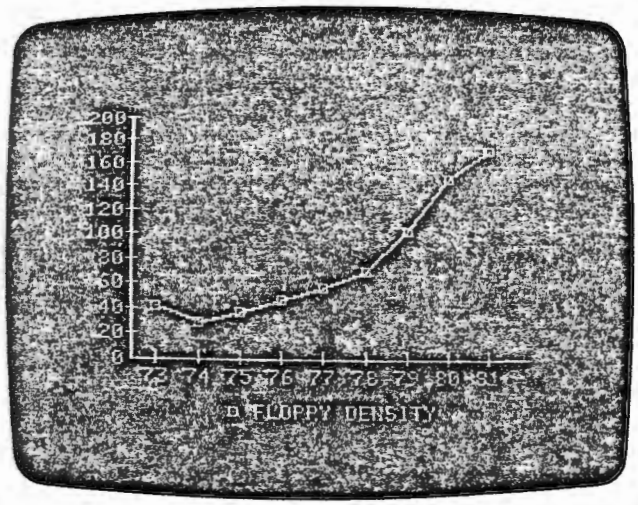


You can change both the range and the scale when you draw a cha You might want to show only a subset of the range. You might want sm variations to show up more or to show up less. The scale and range have significant effect on how a person perceives the data in a chart.

How to Change the Scale

We will use a different chart for this portion of the lesson. Go back to the Select menu, specify a LINE chart, and select the series FLOPPY DENSITY.

If you forgot, SELECT takes you back to the Select menu. LINE specifies a line chart. FLOPPY DENSITY is one of the series on the list. When the Main Plot menu returns, select PLOT and draw the new line chart.



Press any key to bring back the status area after the chart is drawn. Select the Options menu again with the OPTIONS item in the menu.

One of the items on the Options menu is RESCALE. Move the cursor to RESCALE and press RETURN.

The status area configuration that requests data appears in the status area. The prompt asks for a Y-AXIS MINIMUM. The current minimum used in the chart is 0, change it to −200. Enter −200 and press RETURN. Next you are prompted for the Y-AXIS MAXIMUM. The maximum is currently 200, change it to 100. Enter 100 and press RETURN. Finally, you are prompted for the # AXIS DIVISIONS (2...12). You can specify any number of divisions from a minimum of 2 to maximum of 12. The new scale, −200 to 100, divides nicely into 6 divisions. Enter 6 and press RETURN. If you do not enter a valid number, the RESCALE operation is canceled.

To determine the number of divisions, subtract the minimum scal value from the maximum value. A good number of divisions is any num ber in the range 2 through 12 that evenly divides into the difference. I the above example, 100 minus −200 equals 300. 2, 3, 6, and 12 give divi sions of 150, 100, 50, and 25. Others, such as 4 and 5, will work but resul in divisions of 75 and 60 which are not as common as chart units as 25, 5C and 100.

The Main Plot menu returns but nothing else happens. The scale di not change.

You didn't do anything wrong. You must select PLOT again to redra the chart with the new scale. Press RETURN with the cursor on PLO After the PLEASE WAIT... message, there is a beep from the computer an the message DATA OFF SCALE: Y TO DISPLAY appears in the status arec This message means that there are data points in the series that ar outside the scale you specified. This is just a warning that the chart wi not contain all the data points in the series. If you press the Y key th program continues and draws the chart. If you press any other key on th keyboard, the PLOT request is canceled.

Press Y to continue. For each data point that the program cannot pl on the chart, it sounds a beep. There are two beeps sounded while th program draws this chart. The last two points in the series do not f within the scale.

This situation holds true for line, area, scatter, and hi-lo charts. How ever, if you attempt to draw a bar chart that goes off the scale, the progra stops at the first off-scale bar. The drawing of the chart is terminated wit the message CAN'T! PRESS ANY KEY. If you think about it, an off scale bc chart actually gives incorrect information. A person reading the cha wouldn't know that certain bars should continue beyond the top of th scale. It is better to rescale and try again than to show incorrect informc tion.

Confusing the VisiTrend/VisiPlot Program

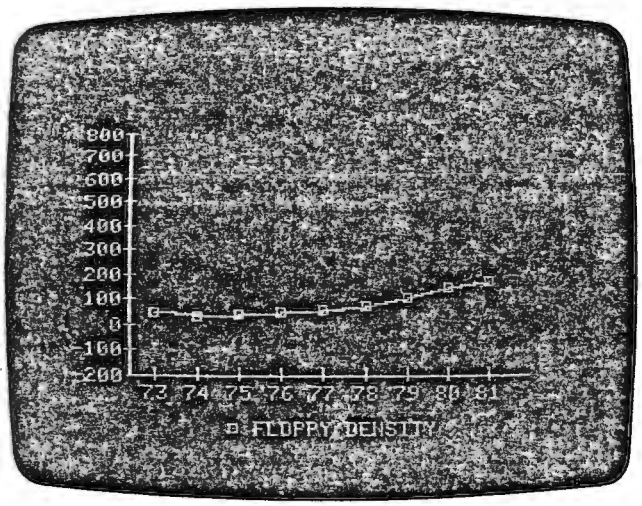
You can try to confuse the program by giving a minimum scale valu that is greater than the maximum value. The program assumes that yc reversed the values and switches them back. If you give the same valu for the minimum and the maximum, the program uses this value as th minimum and sets the maximum approximately 20 percent higher.

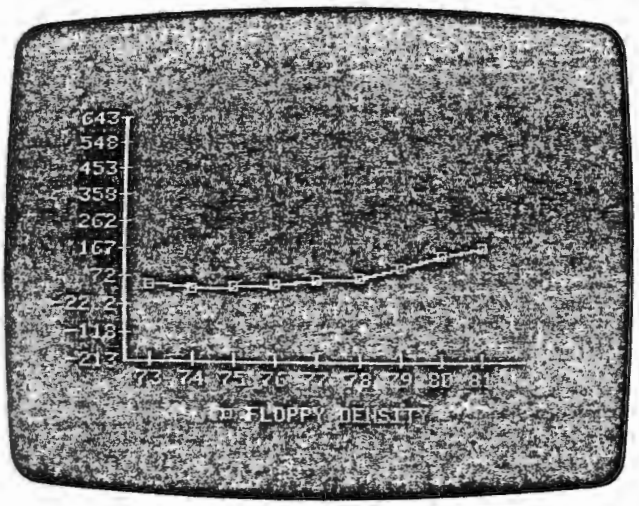
If you give a number of divisions less than 2 or greater than 12, the valu is not accepted and the program selected value is used. If you don't ente any number, that is, just press the RETURN key, the RESCALE request canceled.

Aesthetic Charts

The VisiTrend/VisiPlot program does its best to generate a good scale for your chart. There are times, however, when the values it chooses turn out poorly. When this happens, you should consider rescaling the chart.

When you select a scale, the program takes your request literally and does not try to change it. You will, at times, come up with some odd looking scales. This is especially true if you select a number of Y-axis divisions that are not an even divisor of the difference between the minimum and maximum scale values. For example, if you set a scale from −200 to 800 with 10 divisions, the labels read −200, −100, 0, 100 and so on. But if you pick a scale from −212.39 to 643.22 with 9 divisions, the chart, while correct, is quite unaesthetic as you can see in the following photographs.

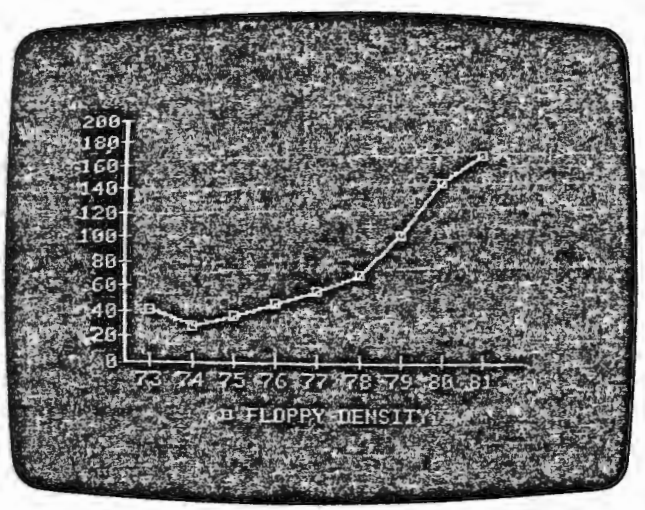




How to Change the Range

Let's start with an unchanged version of the FLOPPY DENSITY series You can choose whether to go back to the Select menu and get a fres copy of the series or change the scale back to 0 to 200 with 10 divisions If you need help with your choice see either "The Select Menu" or "How to Change the Scale."

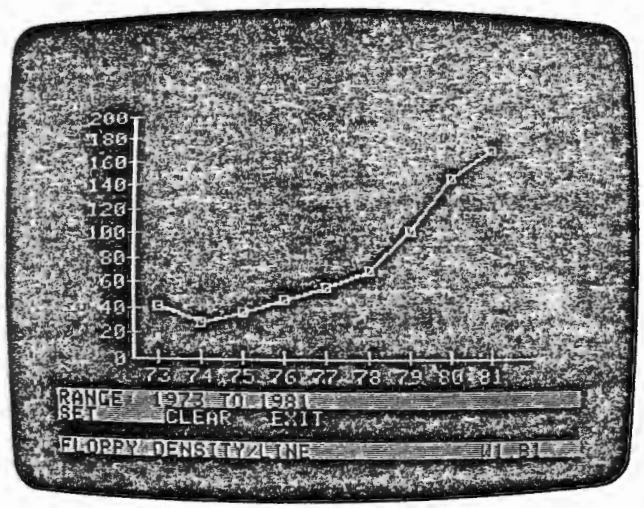
Now you should have a FLOPPY DENSITY line chart on the screen that looks like the following photograph.



Move the cursor to OPTIONS again and press RETURN.

Now move the cursor to RANGE and press RETURN.

The status area changes. The top line reads RANGE: 1973 TO 1981. The RANGE menu offers three choices: SET, CLEAR, and EXIT.



EXIT returns you to the Main Plot menu.

The SET option specifies that you want to change the range. With the cursor on SET, press RETURN. The data input configuration of the status area appears. The prompt asks for the MAJOR START (YEAR). Enter 1974 and press RETURN. The program now prompts for the MAJOR END (YEAR). Enter 1990 and press RETURN. The Main menu returns and nothing happens to the chart. Just as you did with the RESCALE option, you must select PLOT to see the chart with the new range. With the cursor on PLOT, press RETURN.

You took a year off the front of the series and added nine years to the end. You can lengthen or shorten a range. As you change the range and take out data points, you might change the scale. If you specify a range that does not coincide with any of the data points, you get the message CAN'T! BAD RANGE. A new range must overlap the range of the series by at least two points. You cannot completely exclude any series selected for a multi-series PLOT.

When the program prompted for start and end dates it did not ask for period. If the period is other then 1 (annual), the program prompts for th year and the period for both the start and the end dates.

Select the Options menu again and then the RANGE option. This tim move the cursor to CLEAR and press RETURN. When the Main men returns, PLOT the chart again. This time it is drawn with the original range The CLEAR function removes a user-defined range and returns to th range stored in the series. The CLEAR function does nothing if you hav not changed the range.

The Interplay Between Scale and Range

When you change the range of a chart, the scale is automaticall recalculated for the data points within the new range. If you change th scale with the RESCALE function before or after changing the range, th VisiTrend/VisiPlot program does not perform any scale recalculation.

More About Ranges

The program calculates the range before it draws a chart. When onl one series is selected, the resulting range is the range of that one dat series. But if two or more series are selected, the calculated range is eithe the union or intersection of the ranges of the individual series dependin on the type of chart.

The union of ranges means that the earliest starting date and the late ending date are used. The union of ranges is used with line and are charts. The intersection of ranges means that only those dates that ar common to both (or all) series are used for the chart range. The intersec tion of ranges is used with bar, hi-lo, and scatter charts.

The maximum number of points allowed in a range is 150 and the min mum is 2. If you try to draw a chart from a set of series whose combine range has more than 150 points, you will get the error message BA RANGE: TOO MANY OR TOO FEW POINTS.

Formatting A Chart

Display the Main Plot menu (press any key if the status area is nc on the screen) and select NEW. NEW erases the existing chart and clear all options you have set. If you do not select NEW, some options such a COLOR and BACKGR, are held over from chart to chart.

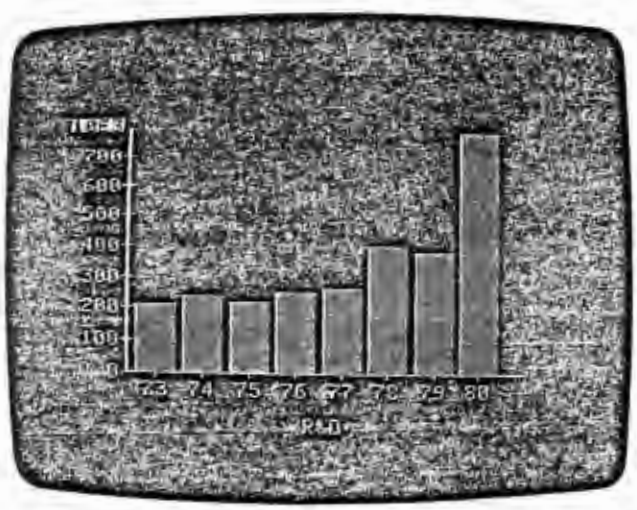
Now select LINE and the FLOPPY SALES series. PLOT it. Notice that tl program draws a line chart with plotting symbols and lines connecti the symbols.

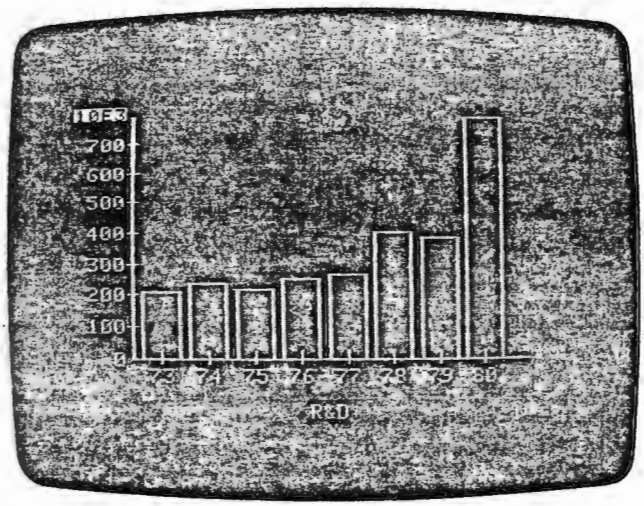
Select OPTIONS. Move the cursor to FORMAT and press RETURN. Tl Format menu is displayed. The choices are SYMBOLS, LINES, and BOT All the line charts you have drawn used both symbols and lines.

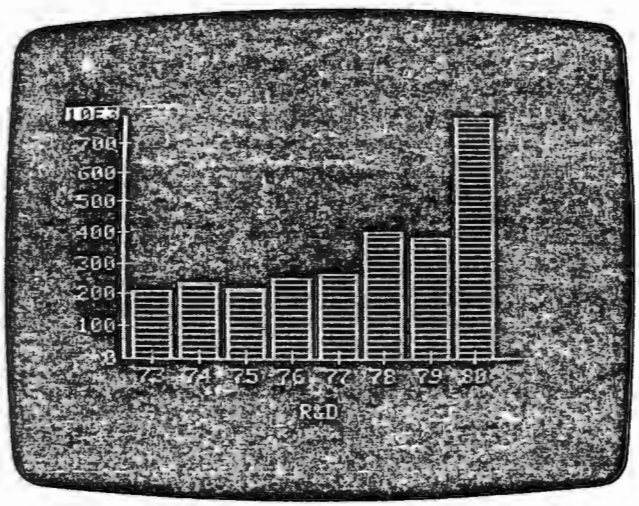
Move the cursor to LINES and press RETURN. The Main menu returr Now PLOT the chart again. It is redrawn without the plotting symbols—ju the lines connect the plotted points.

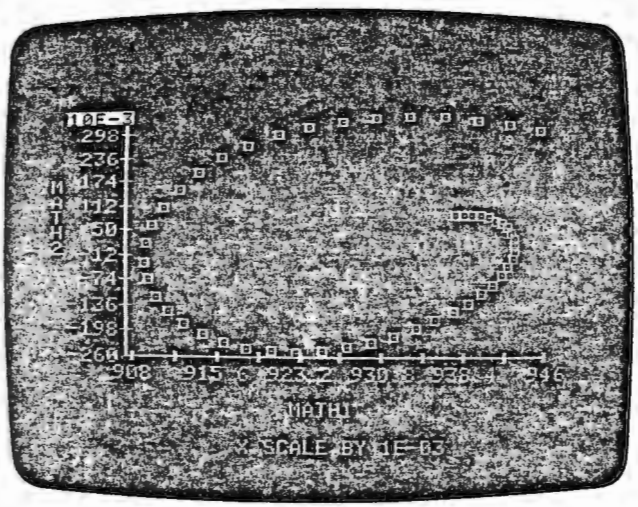
Go back to the Format menu (select FORMAT from the Options men and choose SYMBOLS and redraw the chart again. This time it is draw with the plotting symbols but no interconnecting lines.

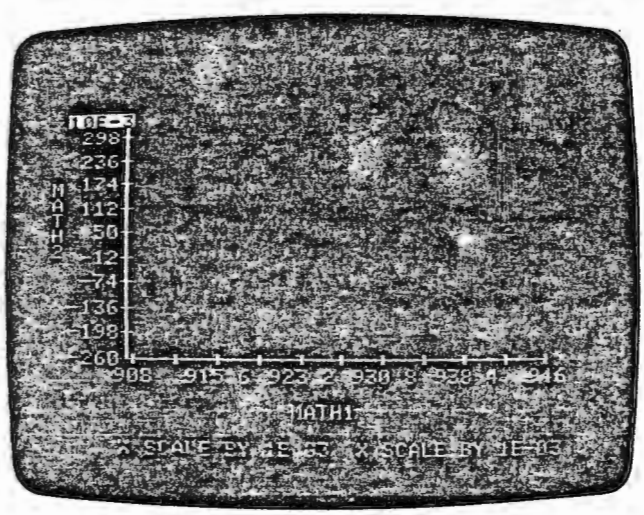
These are the FORMAT options for a LINE chart. The FORMAT option only valid for LINE, BAR, and SCATTER charts. The BAR chart options l you select solid bars (like the bars used in the chart you did earlier in th lesson), outlined bars, or shaded bars. The SCATTER chart options are plot with points or symbols. No lines are drawn in a scatter chart. Th following photographs show the BAR and SCATTER chart formats.




10E3
700
600
500
400
300
200
100
0
74
75
76
77
78
79
80
R&D


10E3
700
600
500
400
300
200
100
0
74
75
76
77
78
79
80
R&D


10E-3
298
236
174
112
50
-12
-74
-136
-198
-260
MATH
908
915.6
923.2
930.8
938.4
946
MATH
X SCALE BY 1E-03


10E-3
298
236
174
112
50
-12
-74
-136
-198
-260
MATH
908
915.6
923.2
930.8
938.4
946
MATH1
X SCALE BY 1E-03
X SCALE BY 1E-03

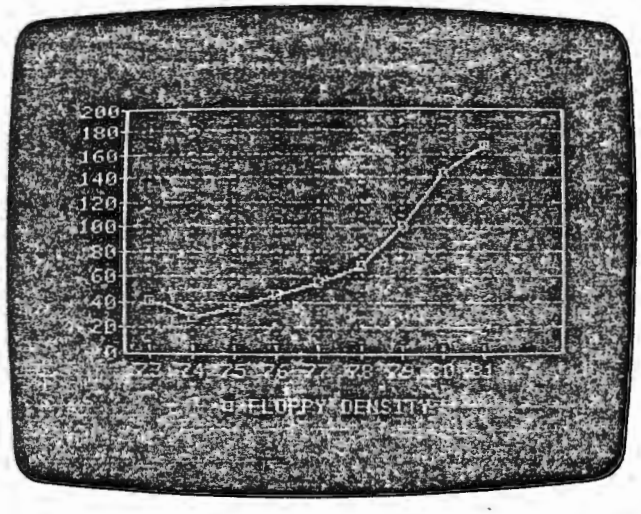
If you try to select the FORMAT option with any kind of chart other tha LINE, BAR, or SCATTER, you will get the message CAN'T! NO OPTION HERE

You might try the FORMAT options with the BAR and SCATTER char now.

Drawing Grid Lines

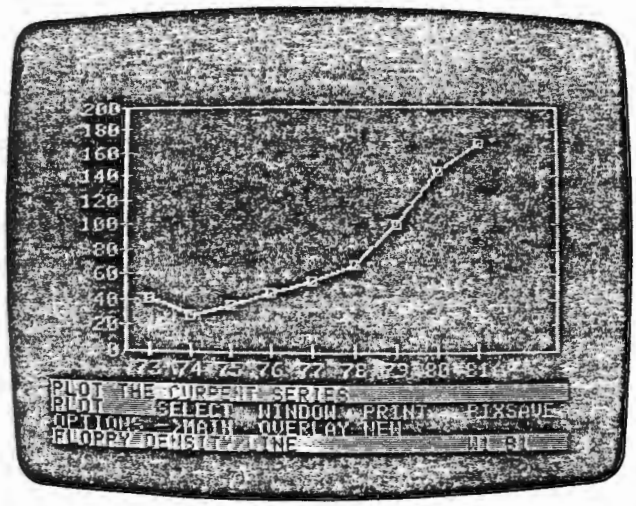
Go to the Select menu by selecting NEW. NEW cancels all options s through the use of the Options menu. Then select LINE, either of the serie and finally PLOT.

Select the OPTIONS item and move the cursor to GRID and pre RETURN. The Grid menu appears. This menu offers the options of drav ing horizontal, vertical, or both horizontal and vertical grid lines. With th cursor on BOTH press RETURN. The program draws the grid lines f every tick mark that has a label.



PLOT the series again. There is no need to go to the Select menu, ju press RETURN with the cursor on PLOT. The program redraws the cha without the grid lines. Go to the Grid menu again and draw only t horizontal grid lines.

Go back to the Grid menu once more and select HORIZ. The progra erases the existing grid lines. This feature operates on the horizontal a vertical grid lines. Note that only the grid lines are erased; the add lines on the top and right are not erased.



You do not have to erase grid lines in the same manner that you drew them. You can draw both horizontal and vertical and then erase only one. You can later redraw an erased set of grid lines.

A chart (other than a PIE chart) must be displayed when choosing the GRID option. If you select the option when no chart is displayed, you get the CAN'T! NO OPTIC . -ERE message.

PRINTING THE CHART

You can print a copy of the chart on a hard copy printer if you have one of the supported printers connected to the computer. Before you can print a chart, you must have initialized the printer driver as described in the section "Printer Support" in the Introduction.

To print a copy of the chart that is on the screen, move the cursor to PRINT and press RETURN. If you have not used the printer during this session (which you haven't if you are following the lesson for the first time) the program prompts for slot number to which the printer is connected. Usually, the printer is connected to slot 1. Enter the slot number and press RETURN. The program immediately proceeds to print the chart on the screen.

THE END OF THE BASICS

You now have enough experience to examine the remainder of the OPTIONS menu. There are three options you haven't used; UNLABEL,

BACKGR, and COLOR. These options erase the labels around the chart, change the background color, and change the plotting color. There are also two options in the Main Plot menu that you have not used: —>MAIN and PIXSAVE. These options reload the Storage Management program and save a binary copy of the screen image in diskette.

UNLABEL must be used with a chart displayed, like the GRID option. Once you erase the labels with this option, you must redraw the chart to get them back.

The BACKGR and COLOR options are most useful if you have a color monitor. See the descriptions of these options in the Reference Section of this manual.

The —>MAIN option prompts with the TYPE Y TO CONFIRM message and reloads the Storage Management program if you press the Y key. Any other key cancels the request. The data series that you have in memory are not lost when you change programs.

The PIXSAVE option saves the screen image in a diskette file in binary form. You are prompted to enter a name for the PIXSAVE file. The file is stored under that name with .PIX added to it. This binary file can be printed at a later time with a program you must supply to match your printer. Appendix A contains a sample of such a program.

The next lesson describes the use of the Storage Management program. Following that, Lesson Three covers the Edit functions.

LESSON TWO

USING THE STORAGE MANAGEMENT PROGRAM

This lesson describes the facilities of the Storage Management progra except for the Edit functions which are described in Lesson Three. Less Two gives you experience and practice using these functions.

Storage Management is the first program you encounter after booti from the VisiTrend/VisiPlot program diskette. Along with creating, loa ing, and saving VisiTrend/VisiPlot data, the Storage Management faci ties provide access to DIF data from other Personal Software products, su as the VisiCalc program. With DIF files, you can create and modify da with the VisiTrend/VisiPlot facilities and then process that data with oth products.

In the last lesson, you used a couple of the Storage Management fun tions. Depending on your experience with computers, you may or may n have known what you were doing. In this lesson you will do more and al get a full explanation.

IF YOU ARE IN THE PLOT PROGRAM

If you are still in the Plot program from Lesson One, display the Ma Plot menu. To get to the Main Plot menu:

- press any key if there is no menu displayed.
- from the Select menu, select NONE.
- from the Options menu, select TITLE and then EXIT.
- from the Title menu, select EXIT.

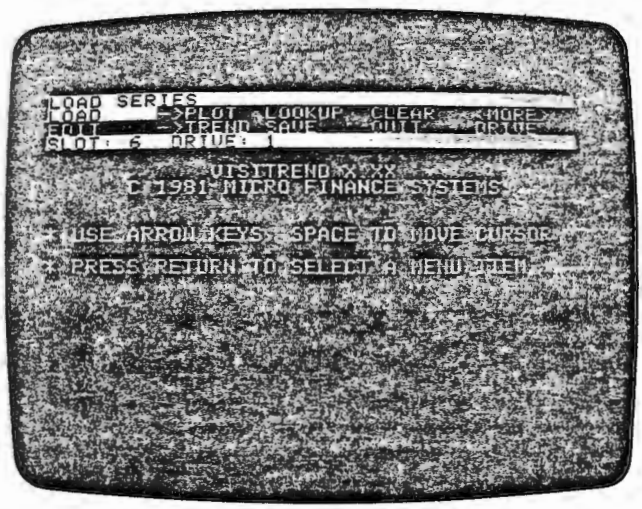
To return to the Storage Management program, select —>MAI You are prompted to press the Y key to verify that you want to chan programs.

IF YOU ARE NOT IN THE PLOT PROGRAM

Load the VisiTrend/VisiPlot program according to the directions in t "Loading the VisiTrend/VisiPlot Program" section in the Introduction.

THE MAIN STORAGE MANAGEMENT MENU

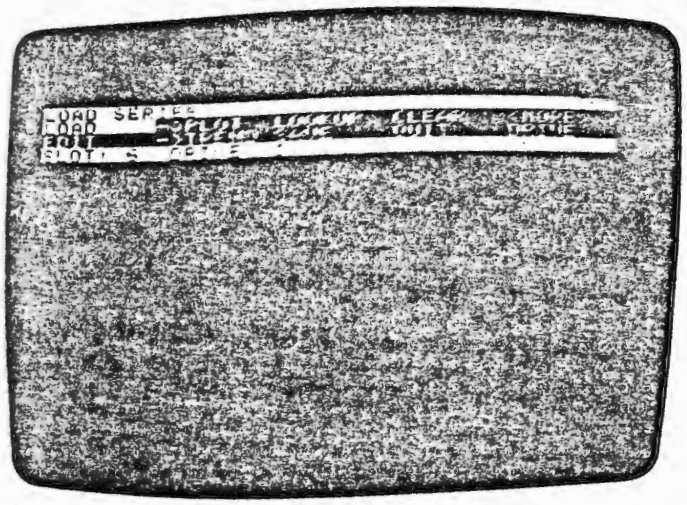
After loading the program, the Main Storage Management status area appears at the top of the screen. The version number of your VisiTrend/VisiPlot diskette, the copyright notice, and some general directions on using the menu follow.



The Main Storage Management menu lists most of the functions available in the Storage Management program. Move the cursor through the menu items and read the long prompts on the top line of the status area.

DATA AND PROGRAM DISKETTES

The bottom line of the Main Storage Management menu lists a slot a drive number. These items specify to which disk drive the program go when asked to load or save data.



The slot number is the address of the boot slot on the main circuit boar (the Apple II mother board) where the disk drive controller is plugge The drive number is either 1 or 2, identifying one of the two drives th can be connected to the disk drive controller. The diskette in the dis drive identified by these fields is called the data diskette. The diskett on which the program is stored is called the program diskette.

A single diskette can serve both purposes, but it is best to use a separat diskette for your data. To use the program diskette, you must remove th write protect tab. The use of the program diskette for data, increases th possiblity of accidentally destroying the VisiTrend/VisiPlot program o the diskette. Your VisiTrend/VisiPlot program diskette contains th VisiTrend VisiPlot programs and some sample data series for practice You used one of the files, SAMPLE 1, in Lesson One.

HOW THE DATA DISKETTE DRIVE IS SELECTED

When you load the VisiTrend/VisiPlot program, it determines wher the data diskette is located. First, it assumes the data diskette is locate at the same slot address from which you loaded the program. Normall this is slot number 6.

The specific drive can be number 1 or 2. If you have a single driv system or only one drive connected to the disk controller from which yo loaded the system, the data diskette drive is number 1. If you have tw drives connected to the controller in the boot slot, the data drive numbe may be number 1 or 2. When you load the VisiTrend/VisiPlot progran part of the program initialization checks if there is a diskette that initialized for use with the VisiTrend/VisiPlot program in drive 2. If ther is, drive 2 is assigned as the data diskette drive. If there is no diskette i drive 2, or if the drive 2 door is open, or the diskette in the drive is n initialized, drive 1 is assigned as the data diskette drive.

For the purpose of this lesson, load the VisiTrend/VisiPlot progra without a diskette in drive 2. If you have already loaded the progra with a diskette in drive 2 and the bottom line of the status area sa DRIVE: 2, do the following:

- Move the cursor to DRIVE in the menu.
- Press RETURN

This is all it takes to change the data diskette drive assignment.

Now double check and make sure the bottom line of the status are reads:

SLOT: 6 DRIVE: 1

The slot number, of course, is whatever slot you load from.

LOADING VISITREND/VISIPLOT DATA

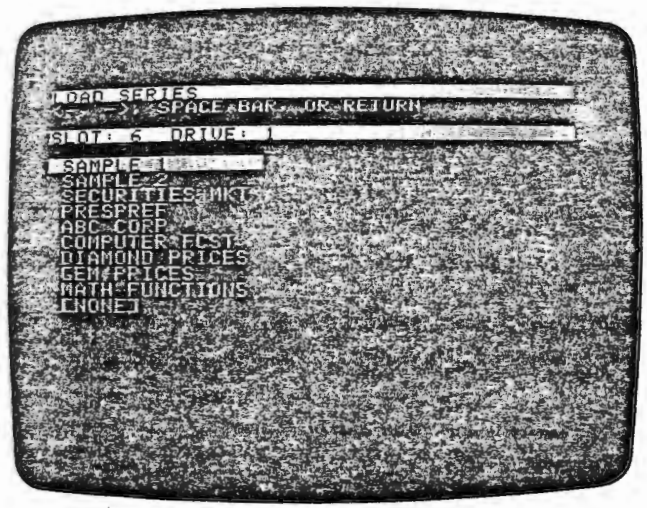
There are two ways to get chart plotting data into the computer. Y can create it with the Edit function (which is described in Lesson Thre or you can read it from diskette.

The data on diskette was originally created with the Edit function transferred from some other program as a DIF file. The use of diskett is a convenience. With them, you can save the plotting data and use later. Without them, you would have to recreate the data over and ov each time you load the VisiTrend/VisiPlot program.

After you load the VisiTrend/VisiPlot program and the Storage Ma agement menu appears, the cursor points to the LOAD function. The lo prompt reads LOAD SERIES.

With the cursor on LOAD, press RETURN.

The menu disappears and the message READING DIRECTORY... temporarily appears in the status area. The disk drive motor begins to run. The message in the status area is replaced with <—,—>, SPACE BAR, OR RETURN, and a list of names appears under the status area. The cursor is no longer in the status area, it is pointing to the top name on the list.



The names on the list are the VisiTrend/VisiPlot files on the data diskette. In this example, the data diskette is also the VisiTrend/VisiPlot program diskette. This method is used only to supply data for these lessons; you should not put your data on the program diskette. There may be other files on the diskette, but the program only lists text files such as VisiTrend/VisiPlot or DIF files. (You may encounter a data diskette that contains other text files such as VisiCalc /SS files. If you try to load a non-VisiTrend/VisiPlot or DIF file, you will get the UNABLE TO LOAD: WRONG FORMAT message.) Each VisiTrend/VisiPlot file contains from 1 to 16 data series. There will be more about files and series shortly.

You select a file for loading by pressing RETURN or the space bar with the cursor pointing to the file name. As described in the Introduction, the cursor moves up and down the list when you press the left and right arrow keys.

The last item on the list is (NONE). Selecting (NONE) lets you go back to the Main Storage Management menu without loading a file. You may need this when you use the LOAD function simply to look at the file list or when you accidentally select LOAD.

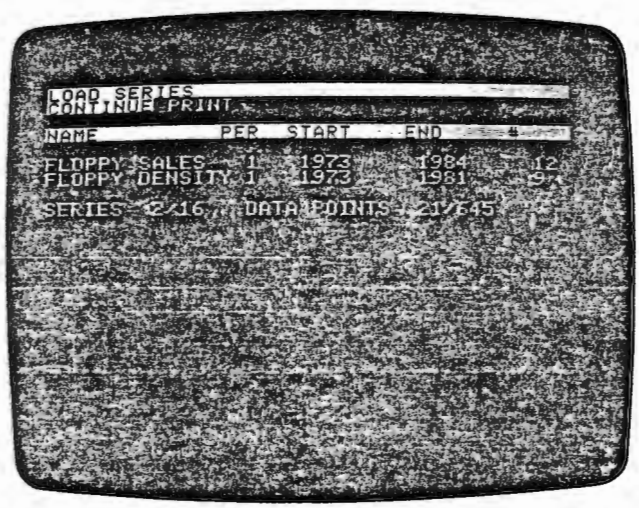
If the whole list of files does not fit on the screen, the last item will be (MORE). Selecting (MORE) displays the next portion of the list. You are at the end of the list when the last item is (NONE) and (MORE) no longer appears on the list.

To start from the top of the list again, select (NONE) and, when the Main Storage Management menu reappears, select LOAD again.

The next sections of this lesson assume that the two series in the file SAMPLE 1 are in memory. If you did not leave the VisiTrend/VisiPlot program after finishing Lesson One, these series are still in memory and you should skip to the next section, "Listing the Series in Memory." If you just loaded the program, continue with the next paragraph.

Move the cursor to the name SAMPLE 1 and press RETURN.

The message vanishes from the status area and the disk drive motor runs again. Characters rapidly flash across the third line of the status area. This is the data being loaded from the diskette. After the file is loaded into memory, a list of the series in the file is displayed. You have the option of CONTINUEing, which returns the Main Storage Management menu, or PRINTing, which prints the list on your printer and then returns to the Main Storage Management menu. Select CONTINUE.



You can only load one file at a time. However, you can select LOAD again and read another file into memory. Memory can hold a maximum of 16 data series or 645 data points, whichever is reached first. If your files each hold four series that average less than 40 data points each, you

could load four files into memory. If you have a file with five series that contain 645 data points, you could only load the one file.

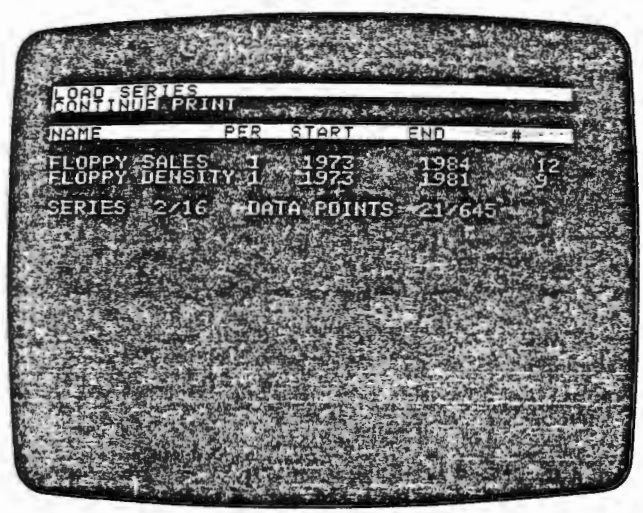
When the memory limit is reached, the message NO MORE ROOM appears on the screen. If the data is in the normal VisiTrend/VisiPlot format, a partial load is done, if there is sufficient room in memory. The error message still appears.

LISTING THE SERIES IN MEMORY

You just loaded a file named SAMPLE 1.

Move the cursor to LOOKUP and press RETURN.

The long prompt reads DISPLAY SERIES INFO. A list of two items appears under the status area, it is the same list you saw when you loaded the file. Most of the list should look doubly familiar. It is the same list you saw when you selected a series for plotting in the Plot program in Lesson One.



If your screen does not look like the photograph, you either loaded the wrong file or had previously loaded series in memory. If this occurs, select CONTINUE, move the cursor to CLEAR and press RETURN. Move the cursor to (KEEP NONE) and press RETURN. This clears all series from memory. Now go back to the section "Loading VisiTrend/VisiPlot Data," continue from that point. If your screen looks like the photograph, continue with the next paragraph.

Just to review, the columns in the list are the names of the series, tl period of the data (the frequency of data points per year), the startii date, the ending date, and the number of points in the series.

This list has an additional line at the bottom that was not present in t Plot program list. It reads:

SERIES: 2/16 DATA POINTS: 21/645

This line shows how much room is occupied. Memory holds a maximu of 16 series or 645 data points. You loaded two series from the file SAMPI 1. That leaves room for 14 more. The two series contain, respectively, and 9 data points for a total of 21. Memory can hold a maximum of 6 data points; there is room for 624 more data points.

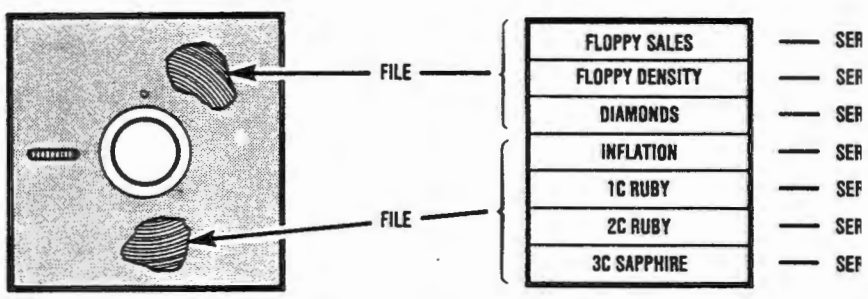
When you are done examining the LOOKUP list, select CONTINUE return to the Main Storage Management menu. Alternately, you m select PRINT to print a copy of the list before returning to the Mc Storage Management menu.

FILES AND SERIES

Some users, especially those who are new to computers, get confus about files and series.

The VisiTrend/VisiPlot program uses floppy diskettes as a permane storage medium. On these diskettes, the program stores data, any kind data, in units called files. A file is nothing more than a collection of dc that is identified by a name called a file name.

When the VisiTrend/VisiPlot program processes data in the comput it uses a unit of data called a series. A series is a collection of data poi for a single chart. A series has a name and is identified by that name, j like a file. The figure shows the relationship between files and series.



After a file is brought into memory, the series in the file have no further connection with the file. They become independent units.

Often there are several series with related data that are used together. For example, for a business you might have series showing sales, costs, gross and net profits. You might have data to show the breakdown for a whole year and also yearly or quarterly data to show growth over the past several years.

All this data is related and probably used together. Many of these series would be plotted on the same chart. Rather than store each series as a file, the VisiTrend/VisiPlot program provides the means of combining up to 16 series (or series containing up to 645 data points) in the offline storage unit—the floppy diskette file. To access the data for these series, either for updating or plotting, you load a single file instead of many files.

The points to remember are:

- Both files and series have names
- Files are units of storage on diskettes
- Series are units of data in memory
- A file can hold up to 16 series or 645 data points

CHANGING THE DATA DISKETTE ADDRESS

It was mentioned in the beginning of this lesson that the VisiTrend/VisiPlot program determines the slot and drive address for the data diskette. Many times you may want to change the address. You may have forgotten to put the data diskette into drive 2 when loading the program. You may have more than two drives and want to use drives not connected to the same slot as the drive from which you loaded. There are many circumstances in which you will have to change the address.

The program lets you change the slot and drive addresses individually.

Changing the Drive Address

To change the data diskette drive address, move the cursor to DRIVE and press RETURN. The drive number in the bottom line of the status area changes. If it was 1 it changes to 2 and if it was 2 it changes to 1.

Remember, the LOAD, SAVE, DELETE, and INIT functions read (load) and write (save) to the data diskette in the specified drive and slot. The PIXSAVE function in the Plot program also uses this drive and slot.

After the change the cursor returns to its initial position at LOAD.

Always check the drive and slot numbers before issuing a function that uses the data diskette slot and drive addresses and change them if necessary. If you try to LOAD from a non-existent or empty drive, you get the error message; CAN'T! ERROR: DISK I/O.

Changing the Slot Address

To change the data diskette slot address, move the cursor to <MORE> and press RETURN to display the Main Storage Management menu extension and then to SLOT and press RETURN.

It is only possible to change the slot address if there is more than one disk drive controller in the computer. If there is only one controller, the SLOT function has no effect.

If there are other controllers, they must be in slots immediately adjacent to the boot slot (usually number 6). The SLOT function does not operate with configurations where there is a gap between controller slots such as 6 and 4. With controllers in slots 5 and 6, the SLOT function changes the data diskette slot address to 5 if it is currently 6 and to 6 if it is currently 5.

DISK ERRORS

You should never get a disk error. But they sometimes happen. They are often caused by something you overlooked. You might change the disk drive and forget to put a diskette in the drive. You might leave the drive door open. You might put the wrong diskette—one that is not initialized for VisiTrend/VisiPlot use—in the drive. A diskette might get damaged through mishandling, accident, or disk drive malfunction.

In all of these cases, you will get the error message CAN'T! ERROR: DISK I/O. This message is accompanied by a beep. The message remains in the status area until you press any key. The function you requested is not performed.

If you get the CAN'T! ERROR: DISK I/O message make sure:

- The correct slot and drive numbers are set
- The diskette is in the drive
- The diskette has the correct side facing up
- The drive door is closed completely

Then try the operation again. If you still get the error message, try the diskette in a different drive if you have multiple drives. You might also try a different VisiTrend/VisiPlot data diskette. Make sure you use a dat

diskette for which you have a backup. It is always a good idea to have backup of your diskettes; it is a necessity when you ae having problems.

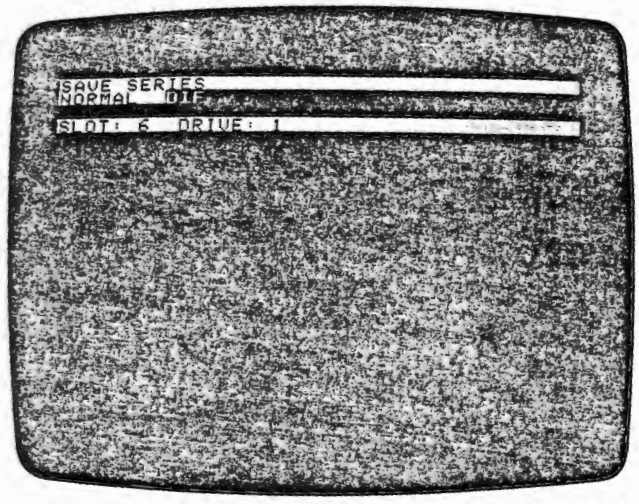
If you continue to get the error, see the troubleshooting guide that came with your computer and disk drives.

SAVING DATA

After you enter new data or modify existing data with the Edit function, you will want to save the data on a diskette for use at a later time. The SAVE function provides the means of doing this.

Move the cursor to SAVE and press RETURN.

A different menu appears in the status area. The options are NORMAL and DIF. This menu lets you choose the format in which the data will be saved. If the data is to be used only with the VisiTrend/VisiPlot program, you will want to save it in the NORMAL format.

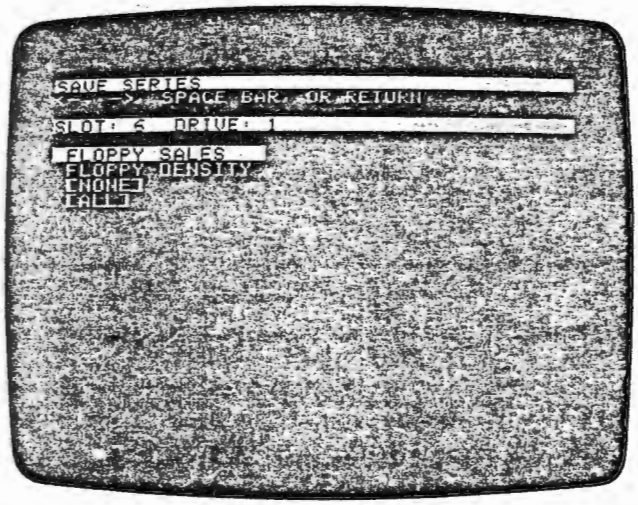


The DIF (for Data Interchange Format) option stores data in a format that can be used by other Personal Software programs, such as VisiCalc.

With the cursor on NORMAL, press RETURN again.

The menu area contains the directions <—, —>, SPACE BAR, O RETURN. Below the status area the program displays a list of the seri currently in memory. At the bottom of the list are the items (NONE) ar

(ALL). The series listed should be FLOPPY SALES and FLOPPY DENSITY, the ones you loaded from the SAMPLE 1 file.



You can cancel the SAVE operation by moving the cursor to (NONE) and pressing RETURN.

To SAVE data, you have a few choices. You can move the cursor to (ALL) and press RETURN, which writes all the series currently in memory out to the data diskette. But if you only want to save a single series, you can move the cursor to the series name and press RETURN. Finally, you can save some of the series in memory by moving the cursor to the name of the first series to be saved and pressing the space bar. When you press the space bar, an asterisk (*) appears next to the series name. The asterisk means the series is selected to be saved when RETURN is pressed but it is not yet saved.

You can change your mind up to the time you press RETURN. If you don't want to save that series after all, press the space bar again. The asterisk disappears. The series is no longer selected for saving. Pressing the space bar again selects the series again. You can select as many or as few series as you want in this manner.

When you select series in this manner, they are all saved to the data diskette when you press RETURN, including the series to which the cursor is pointing whether or not it has an asterisk next to it. If the cursor is on (ALL) or (NONE), they have precedence regardless of the number of asterisks in the list.

For the purpose of this lesson, move the cursor to (ALL) and pres RETURN. The disk drive makes a whirling sound and the status area say READING DIRECTORY... The directory of the files currently on the diskett is listed under the status area. It is the same list you saw when you LOADe SAMPLE 1. But there is a slight difference. In the LOAD list the last iten was (NONE) and in this list it is (NEW FILE).

You now have a choice and a responsibility. You must select the file t which the selected series are to be written. It is a responsibility because, i you select an existing file, the data in it is destroyed and the selected serie are stored in it. You must be careful not to erase any data you want t keep.

Usually, after you have created a new data series with the Edit function you will want to put it in a new file. If you have updated information in a existing file, you will probably want to replace the old data with the new Remember, the selected series replace all the data series in the file, no just those of the same name. For example, if you load a file that contain series A, B, and C, modify series B, and then save series B to the same file the file will contain only series B because you did not save series A and C.

Also remember that all selected series are saved in the same fil regardless of which file they were loaded from.

It is good practice to save all data in new files. If after a period of time you find you don't need the old data, you can erase the old file with the DELETE function which is described later in this lesson.

For now, select (NEW FILE) and press RETURN.

When you choose to create a new file, the program prompts for a file name. Enter a name that is different from all other names on the diskette and press RETURN. You will get an error message if a file by that name already exists on the data diskette.

If you have followed the directions, you just tried to write to the program diskette in drive 1 of the boot slot. And you got the error message, CAN'T ERROR: WRITE PROTECTED. Your diskette is write protected: you cannot write on it. This protects the program diskette from being accidentally destroyed. Press any key except RESET to redisplay the menu.

There was no need to save the series you selected because there is already a copy of them in the file named SAMPLE 1. You didn't make any changes to them because you have not yet used the Edit function.

Remember to check the data diskette drive assignment before starting a SAVE. The data diskette drive number cannot be changed after you start the SAVE. If you forget to change the drive number, cancel the SAVE.

You can cancel a SAVE function by selecting (NONE) when the list of series is displayed. If you go beyond that point before deciding to cancel, you can select (NEW FILE) from the list of files and enter a RETURN without a name when prompted for a file name. The lone RETURN is an invalid response that cancels the function.

CREATING A DATA DISKETTE

Before you can perform a successful SAVE, you must create a new data diskette. A data diskette is any diskette that is initialized by the VisiTrend/VisiPlot INIT function or by the DOS 3.3 INIT (Initialize) command. See **The DOS Manual** for information on initializing diskettes with DOS 3.3.

To use the VisiTrend/VisiPlot INIT function, move the cursor to <MORE> and press RETURN. The remaining Storage Management functions are displayed. Move the cursor to INIT and press RETURN.

You are prompted to put the diskette to be initialized into the data disk ette drive. Put the diskette in the drive, close the door, and press RETURN If the diskette is already initialized, you are given the opportunity to cance the operation. The INIT function destroys all the data on the previously initialized diskette.

If you try to initialize the VisiTrend/VisiPlot program diskette, the IN function detects it and automatically cancels the operation without you intervention.

A diskette initialized with the INIT function has Apple DOS 3.3 on it bu does not have a HELLO program, therefore, you cannot boot from VisiTrend/VisiPlot program initialized diskette.

When the INIT function is complete, you are returned to the Mai Storage Management menu, not to the extension menu from which yo selected the INIT function.

After you have created an initialized diskette, you can repeat the pr ceding section on saving data and actually SAVE the data. If you have two drive system, put the initialized data diskette in drive 2 and chang the data diskette drive number with the DRIVE function. If you have a or drive system, remove the program diskette and put the data diskette Drive 1. The program diskette does not have to be in Drive 1 until you loc the Plot program. When the program diskette is needed but not preser you are prompted to put it into Drive 1.

CLEARING SERIES FROM MEMORY

When you SAVE data on a diskette, the copy of the data in the computer memory is not erased, it remains there. There are times when you will want to eliminate some or all of the series from memory to make room for other series. After you have saved new and modified series on diskette, you may want to load some others. You may have to make room for the new data you want to load.

The CLEAR function erases some or all of the series from memory. Move the cursor to CLEAR and press RETURN. The menu is replaced with the direction SELECT SERIES TO CLEAR. It is important to remember that you must select the series you want to erase, not the ones you want to keep.

Again, a list of the series in memory is displayed under the status area. Along with the series names there are two extra options: (KEEP ALL) and (KEEP NONE). The former erases nothing from memory, in effect, it cancels the CLEAR function. The latter erases everything from memory.

You can erase a single series by moving the cursor to it and pressing RETURN. You can erase two or more series by moving the cursor to the name and pressing the space bar. Just like the SAVE function, the series name is marked with an asterisk (*) indicating the series is to be erased. Pressing the space bar again eliminates the asterisk. You can mark as many series with an asterisk as you wish before pressing RETURN. Remember, the series to which the cursor is pointing is also erased when you press RETURN whether it has an asterisk or not. You should leave the cursor on the last series to be erased.

You are going to clear the series FLOPPY SALES from memory. Remember, this has no effect on the copy of the series that is on diskette in the file SAMPLE 1. Move the cursor to FLOPPY SALES and press RETURN.

After you press RETURN, the program displays a list of the remaining series in memory, just as it does for the LOAD and LOOKUP functions. You can CONTINUE which returns to the Main Storage Management menu or PRINT the list and then return to the Main Storage Management menu.

CALLING THE PLOT AND VISITREND PROGRAMS

When you are done LOADing and EDITing data, you normally want go to either the Plot or the VisiTrend program. The —>PLOT option ca the Plot program from the program diskette and reads it into memor overlaying the Storage Management program. The —>TREND opti calls the VisiTrend program from the program diskette and reads it in memory, overlaying the Storage Management program.

You have already seen what happens when you call the Plot progra You used this function in Lesson One.

In this lesson we will review the procedure but with the VisiTre program.

Move the cursor to —>TREND and press RETURN.

The menu disappears and you are given a chance to change your mir You are prompted to press the Y key to verify that you do in fact want leave the Storage Management program and load the VisiTrend progra If you press any key exept Y, the request is cancelled and the Mc Storage Management menu is redisplayed. Press the Y key and t process of loading the VisiTrend program begins.

When loading the Plot program, you must LOAD data into memory fr diskette or create it with the EDIT functions; you cannot load the Plot p gram if you have no data to plot. If you try the program issues the N ACTIVE SERIES error message and cancels the —>PLOT request. You c however, enter the VisiTrend program without first loading data. T VisiTrend program contains the same EDIT functions that are availal in the Storage Management program, therefore, you can create d series in that program.

When the VisiTrend program is loaded, the Main VisiTrend menu displayed. Move the cursor to —>MAIN and press RETURN. Now t process begins in reverse. You are prompted to verify that you want leave the VisiTrend program and return to the Storage Managem program. Press the Y key and after the loading process is completed, initial Storage Management menu is again displayed.

KEEPING DATA WHEN CHANGING PROGRAMS

When you call the Plot or VisiTrend programs, you usually have one or more series in memory. (When going to Plot, you must have data in memory.) This data is preserved in memory when you change programs.

To see for yourself that the data is kept, move the cursor to LOOKUP. Look at the list and remember what is on it. Now load the Plot program and select any chart type from the Select menu. Compare the list of series with the list from the LOOKUP function. They are identical. No data was lost in the transition.

Now go back to the Storage Management program. Do a LOOKUP again and you will find that the list has not changed. You can also go to the VisiTrend program and select the LOOKUP function. The data remains no matter which program you load.

DELETING FILES FROM THE DATA DISKETTE

As you create new data series and modify old ones, your data diskette will fill up. Some of the data will be old series that contain out of date information and some will be series for which you no longer have any need.

For this part of the lesson, make sure the data diskette you created with the INIT function is in your data diskette drive. This is drive 2 if you have a multiple drive system and drive 1 if you have a single drive system.

Also make sure that the correct slot and drive are listed in the bottom line of the status area.

The DELETE function erases these files from your data diskettes. This function is on the Main Storage Management menu extension. Move the cursor to <MORE> and press RETURN. When the menu extension is displayed, move the cursor to DELETE and press RETURN.

The READING DIRECTORY... message is displayed in the status area as the data diskette drive begins running. The list of files on the diskette is listed below the status area. Select a file for deletion in the same manner that you selected a file for loading or saving. Move the cursor to the file name and press RETURN. Because this function permanently erases files you are prompted to verify that you did, in fact, intend to erase a file. You must press the Y key to continue the DELETE function. If you press any other key, the function is cancelled.

You will get an error message if the data diskette is write protected.

RETURNING TO THE MAIN STORAGE MANAGEMENT MENU

When you go to the extension menu, the functions you have used so far, return you to the Main Storage Management menu. If you call the extension menu and decide not to perform any of the available functions, you can return to the Main Storage Management menu by selecting the MAIN option. This option simply returns you to the Main Storage Management menu.

GETTING OUT OF THE VISITREND/VISIPLOT PROGRAM

There is one remaining option in the extension menu that has not been mentioned, QUIT. This option exits the VisiTrend/VisiPlot program and puts you into Applesoft Basic. The Applesoft prompt (]) is displayed. The copy of the VisiTrend/VisiPlot Storage Management program is cleared from memory. To load the VisiTrend/VisiPlot program again enter the command RUN INIT.

LOADING VISICALC DATA

This section describes how to move data between the VisiCalc program and the VisiTrend/VisiPlot program. If you do not use both of these products or have no need to transfer data, you should skip this section and go to the section "In Summary."

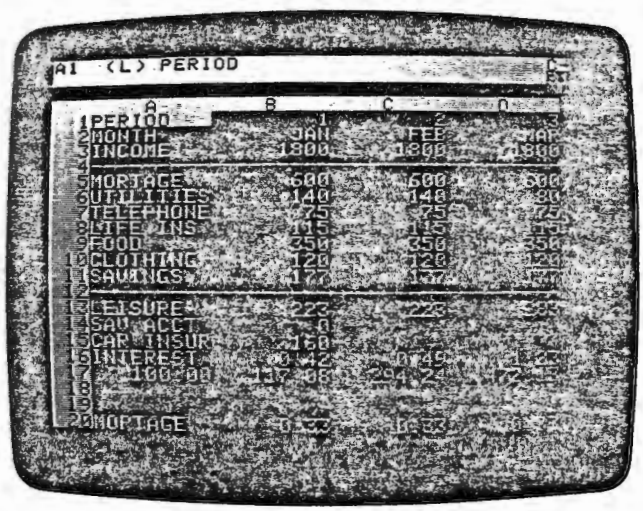
You can load and plot VisiCalc data with the VisiTrend/VisiPlot facilities. The VisiCalc data must be saved in a DIF file. This means that interchange between the two products is only possible if you have a copy of the VisiCalc program at a version number higher than 1.37.

You must save the VisiCalc data that is to be plotted with the /S# command. The stored data should be a sequence of data values that are meaningful to plot. For example, the data items in a single row or column are usually related to each other.

You can use rows or columns of VisiCalc data in VisiTrend/VisiPlot charts. Single or multiple rows and columns can be used. Each row or column is treated as an individual data series. Rows of data use the label, if there is one, in the first (left most) field as the series name. Columns use the top field as the series name. If the first field in either form is not a label, the VisiTrend/VisiPlot program creates a name for each series in the sequence SERIES0, SERIES1, etc. Label fields occurring later in the sequence are converted to 0.

Data from the VisiCalc program, while in a format acceptable to the VisiTrend/VisiPlot program, does not contain all the information the Storage Management program expects. It does not contain a period or a start date. When you load VisiCalc data, you are prompted for the missing items.

The following exercise loads data from the personal budget example in Lesson Three of the Apple II and the Apple II Plus **VisiCalc** manual. If you did the exercise in this lesson, you stored the final sheet on diskette under the name PERSONAL BUDGET. Follow these instructions to create a DIF file of the UTILITIES data in the budget sheet.



1. Move the cursor to A6, the UTILITIES label. Row labels, when included in the DIF file, become series names in the VisiTrend VisiPlot program. If the label spans the VisiCalc columns, only the first column is used, the second column is treated as a zero value. The cursor location marks the upper left corner of the rectangle of data be saved. The lower right corner is specified later.
2. Enter the /S# command to save the data in the DIF format.
3. Specify SAVE (S).
4. Save the data under the name UTIL.DIF. It is advisable to use suffixes such as DIF, VC, and VP to distinguish the format in which different files are stored.
5. Specify a lower right corner of M6.
6. Enter an R to specify that the data be saved in rows rather than columns.

Load the VisiTrend/VisiPlot Storage Management program. Place the VisiCalc data diskette in the VisiTrend/VisiPlot data diskette drive. Select the LOAD function.

The file is loaded in the normal manner, just as VisiTrend/VisiPlot data files are loaded. One of the files is named UTIL.DIF. Move the cursor to this file name and press RETURN.

The loading of the file begins. In a few moments, the disk drive stops and the program prompts for a period for the data series. Enter 12 because the data in this file is on a monthly basis. Next you are prompted for a major start date (year). Enter 1980. Finally, you are prompted for a minor start date (period). Enter 1 for January. The disk drive begins again and the loading of the data is completed.

When the LOAD is completed, the program displays the list of series in memory. The file contained a single data series named UTILITIES. The series name is taken from the label in the VisiCalc row. If you had not saved the label along with the data, the VisiTrend/VisiPlot program would have created a name for the series.

You can go to the Plot program and create a chart of the UTILITIES data from your VisiCalc worksheet. You can also modify the data with the VisiTrend/VisiPlot Edit functions (described in Lesson 3).

After modifying the data with the Edit functions, you can return to the VisiCalc program and put the data back into the worksheet. Note, however, that data saved in DIF does not contain the formulas, if any, in the worksheet. The row you used in the preceding exercise did not contain formulas, it contained only values. You can load this data and overlay the VisiCalc worksheet with no effect on the function of the sheet.

The VisiTrend/VisiPlot series name is not put back into the VisiCalc file as a row label. You must read the data into the value fields, not the label fields. Because the series name is not used, the VisiCalc label will be destroyed.

Formulas are not stored with data written to a DIF file. Therefore, no formulas are put into the worksheet when a DIF file is loaded with the /S# command. If you do this, the worksheet will look correct and values that depend on the new data will be correct. But changes to other values in the worksheet will not affect the newly loaded DIF data, because there are no formulas.

The last point is important enough to repeat. The /S# command does not load or save VisiCalc formulas, only data values.

If you wish to create your own DIF files for use with the VisiTrend/VisiPlot program, see the **Programmers Guide to the Data Interchange Format**, document number SATN-18, which is available from the DIF Clearinghouse, P.O. Box 527, Cambridge, MA 02139.

IN SUMMARY

This completes the Storage Management lesson except for the EDIT function which is described in Lesson Three. You have used all the other Storage Management functions. You might want to go back to the LOAD function and look at some of the other files on the program diskette.

If you have any trouble with a function, look it up in the reference section or return to the part of the lesson in which it was described.

The next lesson covers the use of the EDIT function which lets you create and modify data series.

LESSON THREE

USING THE EDIT FUNCTION

The VisiTrend/VisiPlot Edit function has two major purposes:

- Creating new data series
- Modifying existing data series

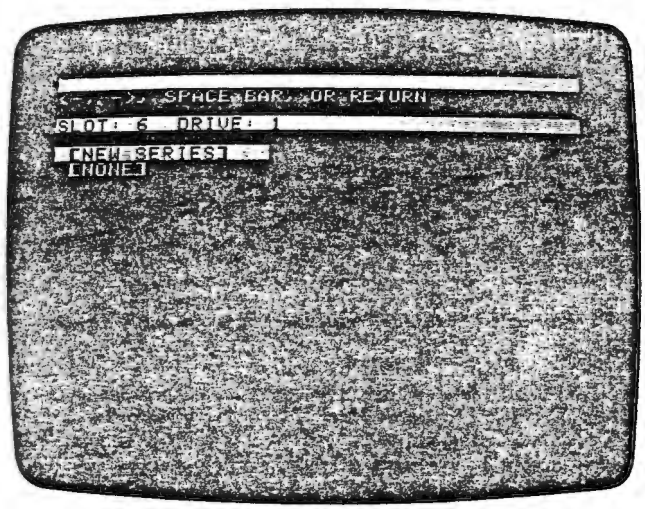
The Edit function is available in the Storage Management program and in the VisiTrend program. The functions and commands available in both are identical. An important difference to keep in mind when creating new or modified series with the VisiTrend Edit function is that you must return to the Storage Management program to SAVE the series on diskette.

This lesson uses the Edit function in the Storage Management program. In the VisiTrend program, entry to the function is through EDIT in the Main VisiTrend menu.

After loading the VisiTrend/VisiPlot program, select the EDIT function from the Main Storage Management menu by moving the cursor to EDIT and pressing RETURN. There is no need to LOAD a file, this lesson is devoted to creating a new data series. If you already have some data series is full, that is, if it has 16 series in it or 645 data points, you will have to CLEAR some of them before continuing with this lesson. The lesson assumes that there are no series loaded from this point.

USING EDIT

After selecting the EDIT function, you are prompted to select a series from the displayed list. The message in the status area, which you have seen before, says you can use the arrow, space bar, and RETURN keys. You did not LOAD a file, so there are no series names in the list, only (NEW SERIES) and (NONE).



(NONE), as it does with other functions, returns you to the Main menu.

In this lesson you are going to enter the data for a series called FIRST. Move the cursor to (NEW SERIES) and press RETURN. The status area changes to the data entry configuration and prompts for a series name.

Type FIRST and then press RETURN. Remember, you can correct typing mistakes with the ESC key. The ESC key backs over the last character and erases it.

Next the program prompts for the period of the new series. The prompt lists the current period that is being used by the program. If you have not done any editing or working with series up to now in this session, the period will be 1. After you have worked with a file, the period from that file is used. For example, if you had just finished working with a file that had a period of 4, the current period would be 4.

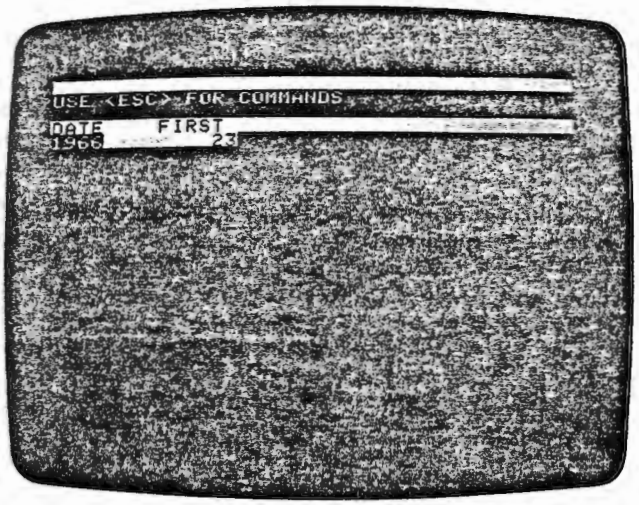
For now select a period of 1 by typing 1 and then pressing RETURN.

Next you are prompted for the starting year of the new series. Enter 1966 and press RETURN. If the period had been other than 1, you would also be prompted for the starting period. A series can begin at any period in its starting year.

If you had not entered a date and had only pressed RETURN, the date 0 would be used. The program makes a choice if it can when you do not enter anything. When it cannot make a choice, it cancels the function or continues to ask for data, whichever is appropriate.

Finally, you are prompted for the first value in the new series. Now the bottom line of the status area contains DATE and FIRST, as column headers. There is a cursor in the column headed by the series name.

The first value for the series is 23. Enter 23 at the keyboard and press RETURN. Note that the value appears in the third line of the status area until RETURN is pressed. In this location, you can correct it with the ESC key. When you have it correct and press RETURN the value moves into the cursor location under FIRST. The starting date appears opposite the value in the DATE column.



The status area changes, it now reads USE <ESC> FOR COMMANDS This completes the initial sequence when entering a new series. If yo had selected an existing series, you would have come immediately to thi point in the program. The only difference being that a series, or the firs 20 data points of the series, would be displayed on the screen.

At this point you can add more values to the end of the series or call th Edit command menu. For now you should add some more values to th series named FIRST. After the series is complete you can use the Edi commands on it.

Adding Values to the Series

To add a value for the year 1967, press the right arrow key. The dat 1967 appears under 1966 and the cursor moves down one line. Type 2 Again the value appears on the third line of the status area. Press RETURI and the value appears in the cursor next to 1967.

Gaps are not allowed in the date sequence. The program automatically adds 1 to the date for each new entry. If the period is 1, the year is incremented by 1. If the period is other than 1, the period is incremented and the year is incremented when the period goes full cycle.

To add the next few values, repeat the preceding process. Press the right arrow key, enter the data, and press RETURN. Enter the values 33 37 and 41. Note that a solid bar separating the dates from the values appears after you make a couple of entries.

There is a shortcut method for entering new data. Press the right arrow key again to show the date 1971 and enter 44 but do not press RETURN Instead, press the right arrow key again. The value, 44, moves to the correct place and the cursor moves down a line to the next date.

Add the remaining values in this manner. Press the right arrow key and enter the value. Add 44, 53, 61, 75, 64, 73, 82, and 79 to the series.

After the last value, the cursor is below the list with the date 1980. We don't have a value for 1980, so press the left arrow key. The cursor moves back up to the 1979 value and the 1980 date disappears.

Replacing a Value

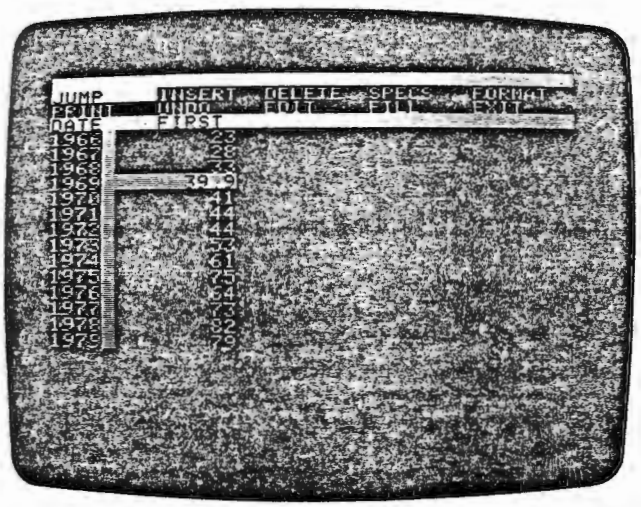
You can move the cursor up and down the list with the arrow keys. In this list the cursor does not wrap around. A little later you will use a rapid means of moving the cursor in a large series.

You can replace a value simply by moving the cursor to the value that is to be replaced and entering the new value. The current value at the cursor location is replaced by the new value when you press the RETURN or arrow key.

Move the cursor to the year 1969 which has a value of 37. This value should have been 39.9. Type 39.9 and press the RETURN or either arrow key. The old value is replaced.

THE EDITOR COMMANDS

You have been working at the data entry level of the Edit function. To leave this level and go to the command level, press the ESC key. The Edit command menu appears.



The Edit command menu provides many functions. With it you can:

- JUMP to a specific year (and period) within the series
- INSERT new data points between existing data points
- DELETE existing data points
- FORMAT the manner in which data is displayed
- PRINT the contents of a series
- UNDO (erase) all changes made to a series
- FILL areas of a series with values generated by predefined algorithms
- EXIT to the Storage Management Main menu and save the work you have done
- Change the specifications (SPECS) of a series
- Return to the entry level (EDIT)

Leaving the Edit Function

The EXIT option returns to the Main Storage Management menu. When you exit by this route, the work you created or modified is saved. Move the cursor to EXIT and press RETURN. The Main menu replaces the Edit command menu and the listing of the series is erased.

To see that you have created a series, select LOOKUP. The list shows that there is a series named FIRST with a period of 1. It begins in 1966, ends in 1979, and has 14 data points. Press RETURN to continue.

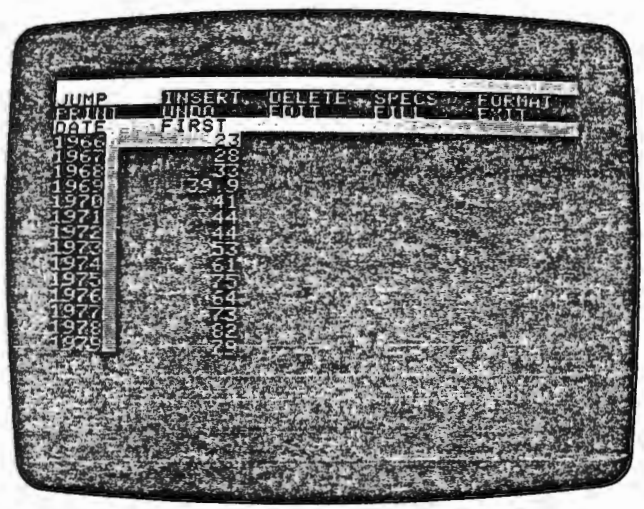
Returning to the Edit Function

Select EDIT again. This time there are three items in the series list, the same entries you saw earlier plus the series you created. Select the new series, FIRST, and press RETURN.

This time you don't have to enter a name, period, or starting date. The contents of the series are listed. The status area contains the USE <ESC> FOR COMMANDS message.

Using the Edit Commands

The following sections show the use of the Edit commands. For each section you will begin in the entry level. The entry level is that part of the function in which you can input initial data to the series. While you are in the entry level, the status area contains the message USE <ESC> FOR COMMANDS. To begin each section, press the ESC key and then move the cursor to the subject command.



In the following section describing the JUMP command, press ESC and then press RETURN. The cursor is located at JUMP when you enter the command menu.

Jump—Moving from Point to Point

The JUMP command lets you move from date to date in the series without repeatedly pressing the arrow keys. Move the cursor to JUMP and press RETURN.

The prompt says <— TOP, —> BOTTOM, YEAR. If you enter a date, the cursor moves to that date. If the series has a period other than 1, you are prompted for the period also. If the date is currently displayed, the cursor simply jumps to that position. If it is not displayed, the screen is erased and is rewritten with the specified date at the bottom or top of the screen (depending on the direction you are moving in the series) and the cursor on it.

If the date does not exist in the series, there is a beep and the date is not accepted. At this point, you should enter a valid date.

Pressing the right arrow key moves the cursor to the last entry in the series. The left arrow key jumps to the first entry in the series.

After the jump is completed, you are returned to the Edit function entry level.

To exit the JUMP command without making a move, press the RETURN key twice.

Insert—Adding An Entry

The INSERT command lets you add a new values at the current cursor location in the series. Insertion with this command works just like adding a value except that it operates anywhere in the series, not just at the end. The command opens up the series at the cursor location. All values at and below the cursor are pushed ahead to the next date.

Type the new data and press RETURN if you are inserting a single value. If you have more than one value to insert, type the new data and press right arrow key. Press RETURN after the last entry. You can correct errors with the ESC key before pressing the RETURN key or the right arrow key. Pressing the RETURN key returns you to the entry level.

Delete—Erasing a Data Point

The DELETE command erases one or more values beginning with the current cursor location. The range to be deleted is listed in the status area. You can abort the DELETE command by pressing the ESC key.

When you select the DELETE command, only one data point, the one at the cursor, is listed for deletion. Moving the cursor, in either direction

broadens the range of values to be removed from the series. As you move the cursor, the range listed in the status area changes. If you move the cursor beyond the end of the series, the DELETE command is cancelled.

You can DELETE in either direction from the original cursor position. However, the initial cursor location will always be the beginning or end of the range to be erased.

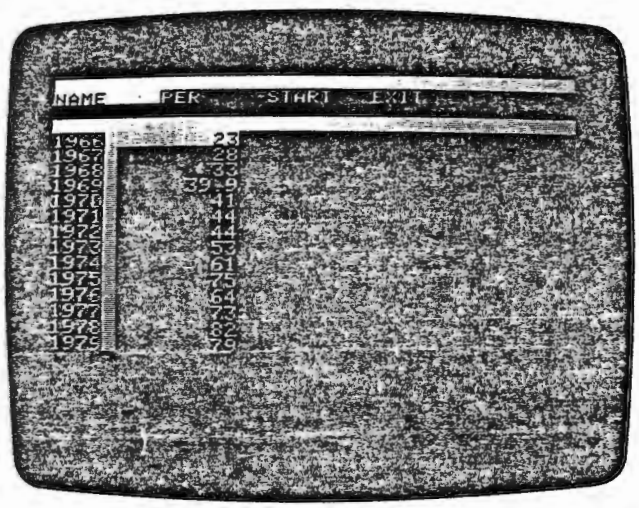
Pressing RETURN when you have defined the correct range removes the selected values from the series. The values below the removed area move up to fill the new empty dates.

You are returned to the entry level.

To exit the DELETE command without making a change to the series, press the ESC key.

Specs—Changing the Series Specifications

The SPECS command provides the means of changing the name, period, or start date of the series. This command displays a new menu. Selecting the menu displays prompts for new data to replace the current series name, start date, or period.



When you change a series specification, the change takes place immediately and is shown on the screen. If you change the name, the new name replaces the old name as the value column header. A new period or starting date causes the date and/or period columns to be changed on the screen. The existing data points do not change, only their date and/or period.

You can respond to the prompts for data by pressing the RETURN ke without entering data. When you do this, the program assumes value For the NAME function, it generates the name SERIESn, where n is number from 0 through 15. For the PER function, it uses the current perioc For the START function it uses the date 0.

Format—Changing the Data Display

The FORMAT command lets you specify how the data values in th series are to be displayed. You can select the fixed format and specif the precision (number of decimal places from 0 to 6) and column widt (total number of digits displayed from 6 to 15). You can also specify thc values be displayed in the floating format.

The command first prompts for a precision (0 to 6) or the floating poir format (−1). Pressing RETURN retains the current format and precisior Next it prompts for the column width which can be from 6 to 15 digits wide Pressing RETURN retains the current column width.

If the values are displayed as a series of greater than symbo (>>>>>>), either:

- The value is too large for the column width. If this is the case, increas the column width.
- The value is an exponential number (such as 1E-03) and you are in fixed format. You cannot enter values in the exponential format b values less than .001 and greater than 9 digits to the left of the decim point are automatically converted to the exponential format.

If you do not choose a display format, the floating format is used.

The FORMAT command does not affect how the values are stored, onl how they are displayed in the EDIT function. The format remains in effe until changed or until you exit the EDIT function.

Print—Listing a Series

The PRINT command lets you print a copy of the current screen conte on your printer. You are prompted for the slot number to which the printe is attached the first time you use the PRINT command during a sessio The program remembers the specified slot number.

The command prints the contents of the current screen without th bold bars and without any blank lines at the bottom of the screen.

PRINT lists the contents of the currently displayed screen and the returns you to the entry level.

You can stop a printing operation by pressind CTRL-C.

Undo—Remove All Changes

The UNDO command cancels all the changes made to the series since you selected the EDIT function. If you UNDO a newly created series, it is completely erased.

Keep in mind that the UNDO command removes all changes made since selecting the series, not just the last change.

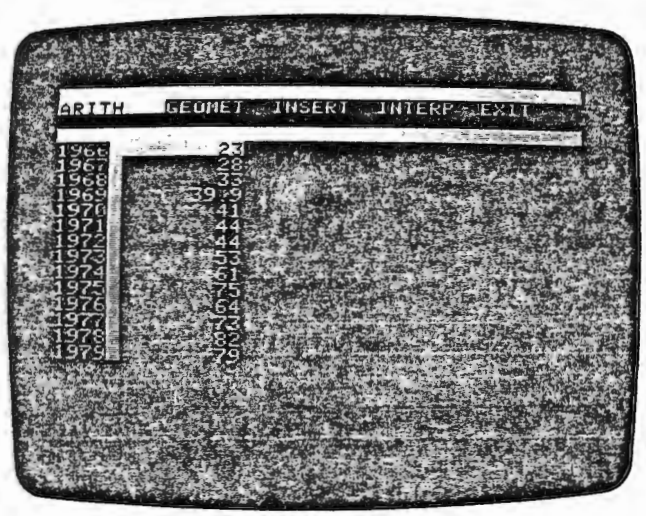
Edit—Returning to the Entry Level

The EDIT command takes you back to the entry level of the EDIT function without executing any of the commands.

Fill—Adding to a Series

The FILL command provides a means of inserting values into the middle of a series interpolating missing values. You can insert values in an arithmetic or geometric progression from the value at the current cursor location. You can also select a whole series and insert it into the series being edited. You can fill in missing values in a series, interpolating between two known values.

The FILL command displays its own menu.



The ARITH and GEOMET functions both operate in the same manner They prompt for a number of values to be inserted. The number can b any value that, when added to the existing points in the series, does no exceed the maximum of 150 points in a series or the 645 points in memory Next the function prompts for a factor to be used in the calculation of th new values. In the ARITH function, the factor is added to the curren cursor value and each generated value until the specified number o values have been generated. In the GEOMET function, each successiv value is multiplied by the factor.

The INSERT function displays the current list of series in memory. Yo can select one. It is inserted, in its entirety, into the current series at th cursor location. If you insert a series into itself, the inserted values ar those that existed before entering the Edit function.

The INTERP function performs a linear interpolation of values beginnin at the current cursor location and continuing to the first non-zero value This function fills in missing data values. The missing values must b entered as zeros. There can be one or more missing values.

If the value at the cursor is not zero, a beep is sounded and the functio is canceled. If the value is zero, the function looks at the preceding perio for a starting point and the next non-zero for an ending value. It the linearly interpolates all points in between.

Point the cursor to the first zero value in the sequence before invokin the function.

The EXIT option returns to the entry level without performing a FIL command.

SOME EXERCISES WITH THE EDITOR COMMANDS

The following exercises give you some practice using the commonl used Edit functions. To do these exercises you must LOAD the fil SAMPLE 2 from the VisiTrend/VisiPlot program diskette.

EXIT to the Main Storage Management menu, CLEAR memory, an LOAD the file named SAMPLE 2 which contains a series with the sam name. You used the CLEAR function in the last lesson. It prompts you t decide what to keep and what to clear. This time, erase everything i memory by selecting the (KEEP NONE) option. Now select LOAD an SAMPLE 2 from the directory listing.

Large Series Displays

Select EDIT and then select the series SAMPLE 2. This series has 133 data points and a period of 12 (monthly). Its start date is 1977 1, the first period of 1977 or January 1977.

The screen fills with numbers when you select the series. The date is in the left margin of the screen. For each date there are 12 periods; for each period there is a value. The dates are to the left of the vertical bar. The period is the first number to the right of the vertical bar. The value is to the right of the period.

Moving the Cursor and Scrolling the Screen

SAMPLE 2 contains 133 data points but the screen can only display 20 of them at a time. To see the values beyond the first 20, move the cursor to the bottom of the screen with the right arrow key. Continue pressing the key when the cursor reaches the bottom. New dates and values appear at the bottom and old ones disappear off the top. This is scrolling; it is one means of moving to any point in the series.

Press the left arrow key until you reach the top of the screen. Continue pressing the key. New values appear at the top and others disappear off the bottom. If you keep pressing the key until you reach the beginning of the series, there is a beep indicating that you can't go any further.

Moving With the Jump Command

If you wanted to add more values to the end of this series, you would have to press the right arrow key 133 times to reach the end. You can save time and effort by using the JUMP command. Press ESC to display the Edit command menu. Press RETURN with the cursor on JUMP.

The JUMP prompt says that you can enter a date or press one of the arrow keys. If you specify a date, the portion of the series containing that date is displayed.

Enter 1981 and press RETURN. You are asked for the period because this series has a period other than 1. Enter 1 and press RETURN. The data on the screen is erased and new data appears. The cursor appears at the bottom of the screen on the first period of 1981. If you specified the same date and period from a point below it in the series, the target date would appear at the top of the screen. The location of the target depends on the direction the cursor must move.

You can also use the arrow keys with the JUMP command. Press ESC again. Select JUMP. The right arrow key moves to the bottom of the serie and the left arrow key to the top. Press the right arrow key. The displa changes; the new display shows the end of the series.

Formatting the Data

The values in this series are displayed with different numbers of decima places, to different precisions. This is the floating point data format. Thi format gives a cluttered appearance to the screen and, at times, make the values difficult to read.

With the help of the FORMAT command you can display the values in a manner that is neater and more readable.

Go to the Edit command menu and select FORMAT. The top line of th status area indicates that the data is currently in the floating format. Th second line tells you to enter a value of 0 through 6 to set a fixed precision The number indicates the number of decimal places to which eac number is to be displayed. It also says that you can enter −1 to specif floating format, which is the format in which the data is currently dis played. The last item in the prompt says to press RETURN alone to cance the command.

Enter the number 2 to specify the fixed point format with two places c precision. Press RETURN. You are prompted for the column width. Th width is the total number of digits that can be displayed in the colum including the decimal point. This can range from 6 through 15. If yo press RETURN without entering a value, the current column width i kept. For now, just press RETURN.

The series on the screen is redisplayed with the decimal points lined u and two digits to the right of the decimal point.

Printing the Data On the Screen

If you have a printer attached to your computer, you can print th contents of the current screen. Press ESC and select the PRINT comman If you have not yet used the printer since loading the VisiTrend/VisiPl program the program prompts for the slot number to which it is attache If the printer is connected to slot 1, enter the number 1 and press RETUR

The printer begins printing the screen contents. You can let the whol screenful print or can stop it by pressing CTRL-C.

Inserting Data Into the Middle of a Series

Display the beginning of the series and move the cursor to the fir period of 1978. Press ESC and select the INSERT command.

Note that the value that was in this location has moved down one plac in the series. Also, the values that followed the value have each move down one place. The dates did not change, however, one new perio was added to the end of the series.

You can now insert a new value at this point in the series. Type 9 and press RETURN. The value 999 is inserted into the 1978 period location.

To insert multiple values, press the right arrow key after typing th value. The value is placed in the current open space and a new spac is opened following the new value. To terminate the insertion, pre RETURN. Press ESC, select INSERT again and enter two more values 999 using the right arrow key. After you enter the second value, pre RETURN.

After RETURN is pressed, the editor returns to the entry level.

Deleting Data from a Series

If you decide you don't want the three 999 values in the series, you co delete them with the DELETE command.

Move the cursor to the first 999 and call the Edit command menu b pressing the ESC key. Select DELETE. The status area says you are current set to delete from 1978 1 to 1978 1, or one point in the series. The statu area also says that you can press the ESC key to abort the deletion.

Press the right arrow key several times and watch the status area eac time you press the key. The TO date changes as the cursor moves fro value to value. Move the cursor back to the third 999 value at 1978 3. Pre RETURN. The display is erased and rewritten. The three 999 values a removed and the series is back to its original condition.

CONTINUING WITH THE EDIT FUNCTIONS

The remaining Edit functions should be easy to use with the experienc you now have. If you have any problems with any of them, look them u in the reference section.

LESSON FOUR

USING THE VISITREND™ PROGRAM

The VisiTrend program develops ancillary data series used in analysi and forecasting techniques. The methods include derivation of movinç averages, smoothed data, percent of change, leading, lagging, anc cumulative total functions. Additionally, new series can be created b taking sums ratios, logs, or other mathematical or logical transformation on the data. The program performs linear multiple regressions (using th ordinary least squares method). It calculates and displays the majo statistical measures of a multiple regression including the standard error of the coefficients and the regression, T-statistic, R-Bar squared, th F-statistic, and the Durbin-Watson statistic. It also performs trendlin forecasting. The program calculates and generates tables of statistica measures such as minimum, maximum, mean, variance, standard devia tion, and correlation coefficient.

NOTE: This lesson assumes you are familiar with techniques that ar beyond the scope of this book.

The use of DIF files lets you move data from other Personal Softwar programs, such as VisiCalc, perform any statistical function, and retur the new data to the other program.

BEYOND THE VISIPLOT PROGRAM

The VisiPlot program gives you the advantage of creating a visua representation of data. Seeing two sets of values on a screen can be mucl more meaningful than looking at two lists of figures. The charts let yo see relationships at a glance. The VisiPlot program gave you the capa bility of generating scatter charts, plotting two series against each othe to see if there is or is not a basic correlation.

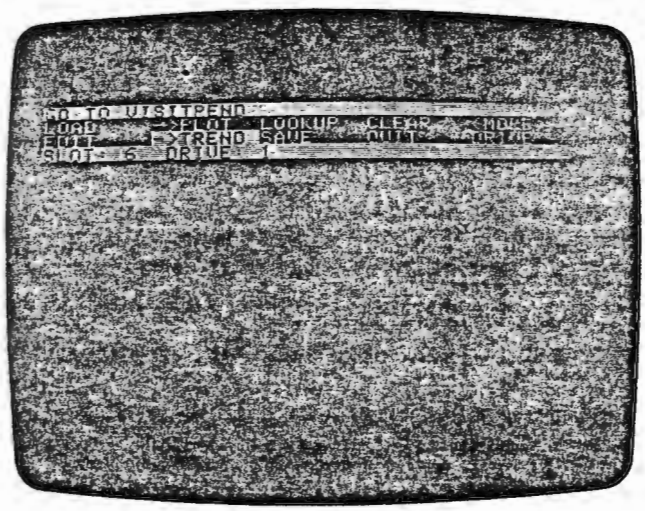
The VisiTrend program goes beyond these useful but limited visua measures with hard, proven mathematical techniques for forecasting evaluation, and comparison.

LOADING THE VISITREND PROGRAM

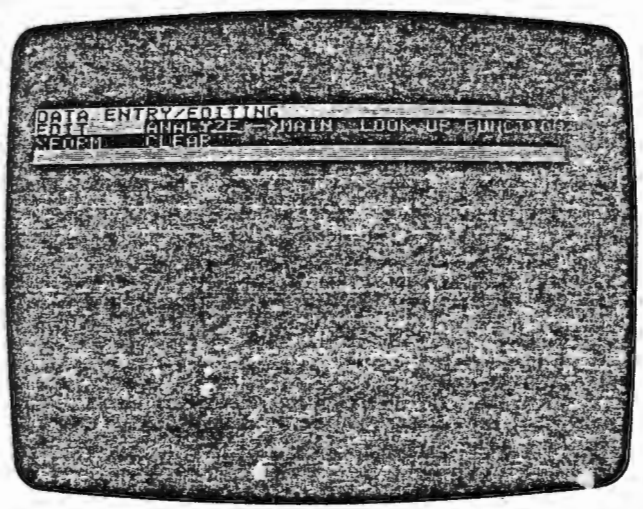
You enter the VisiTrend program from the Storage Managemen program via the —>TREND menu item. This lesson uses the series in a fil named SECURITIES MKT. This file is large, it contains 13 series. If yo have any new series in memory or modified series, store them on diskett

with the SAVE function. Then remove all series from memory with the CLEAR function. When memory is empty, LOAD the file SECURITIES MKT.

Move the cursor to —>TREND and press RETURN. The long prompt reads GO TO VISITREND.



The program responds with TYPE Y TO CONFIRM. Press the Y key and the PLEASE WAIT... message is displayed. Shortly the disk drive begins to run. When it stops, the VisiTrend menu is displayed.



With three exceptions, the menu items should look familiar. You have used four of these menu items in the Storage Management program or the Plot program. You have used:

- EDIT which provides the means of entering new series data and modifying existing data. This function is identical to the EDIT function in the Storage Management program. The data entry and editing functions are often useful when handling VisiTrend data; the presence of this function saves the time that would be required to go to the Storage Management program and back.
- —>MAIN, which reloads the Storage Management program and passes control to it. This function operates exactly as its counterpart in the Plot program. It prompts you to verify the selection by pressing the Y key.
- LOOKUP, which displays a list of all series currently in memory. This function operates exactly as the LOOKUP function in the Storage Management program.
- CLEAR, which removes one or more to all series from memory. This function operates exactly as the CLEAR function in the Storage Management program.

If you are not sure about the use of these functions, review their use in Lessons One, Two, or Three.

The remaining three functions contain the heart of the VisiTrend capabilities:

- ANALYZE performs linear multiple regression and trendline forecasting, calculates the common statistical measures of series such as variance, standard deviation, and coefficient of correlation, generates tabular output, and formats the data.
- FUNCTION generates new series that are permutations of existing series. It calculates the moving average, percent of change, and cumulative total; does exponential smoothing; and generates leading and lagging series.
- XFORM provides the facilities that allow you to develop your own transformation of a data series. It allows the manipulation of series through mathematical and logical operations (see Applesoft functions).

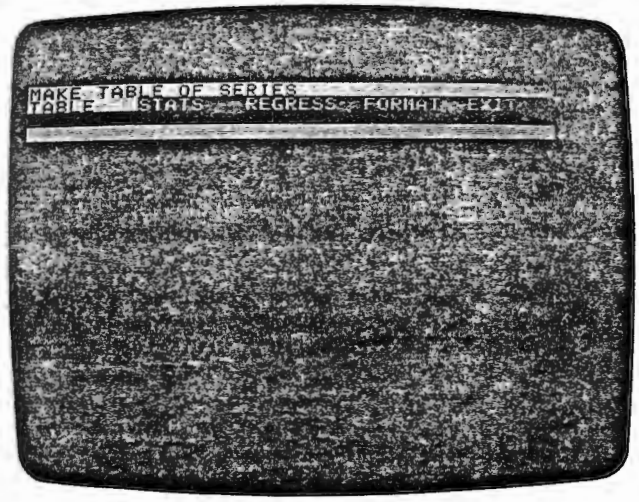
KEEPING TRACK OF MEMORY

Many of the VisiTrend functions create new series. This means that there must be space for new series before executing those functions that create series.

All operations in FUNCTION create one new series. The multiple regression function in ANALYZE creates two new series. Before beginning execution, use the LOOKUP function to make sure there is enough space for the series output by the function. If there is not enough space, you must make space with the CLEAR function.

USING THE ANALYZE FUNCTION

The ANALYZE function displays a menu of five items. Move the cursor to ANALYZE and press **RETURN**.



There are two familiar functions in this menu.

EXIT returns to the Main VisiTrend menu. It provides the route back without performing any operation.

FORMAT lets you specify how the data will be displayed. This function works exactly like the FORMAT function in the EDIT commands menu. It lets you specify fixed point or floating point formats, the number of places of precision (0-6) in the fixed point format, and the total number of spaces in which values are displayed (6-15).

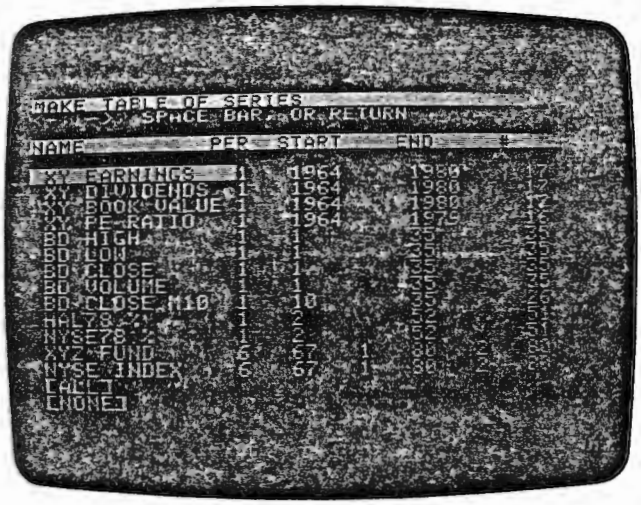
The remaining items, TABLE, STATS, and REGRESS, are described in the following sections.

Listing Series In Table Format

The TABLE function displays one or more series, up to the number that can be displayed on the 40 column screen. This function lines the values up by date for easy comparison and evaluation.

Because there is a limited space for the display of data, the function ignores series for which it has no room. The number that can be displayed depends on the column size specified in the FORMAT function. The program uses a column width of nine characters and the floating point format.

Move the cursor to TABLE and press RETURN. The familiar listing of series in memory appears.



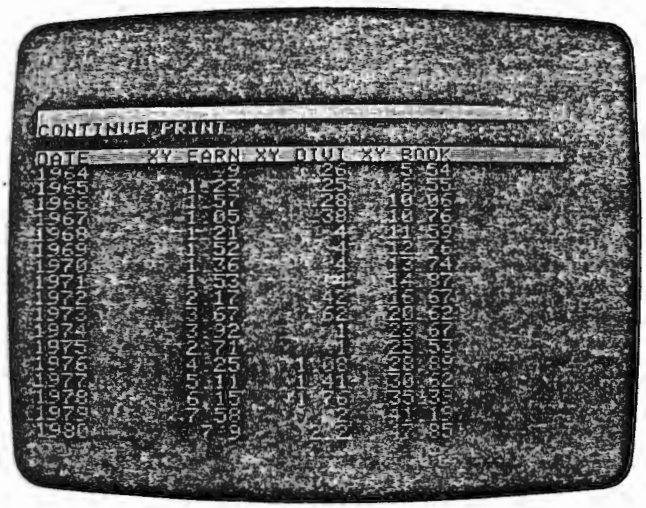
You can select a single series by moving the cursor to the name and pressing RETURN. To select two or more series, move the cursor to each name in turn and press the space bar. As you have seen before, pressing the space bar marks a name with an asterisk (*), indicating that the series is selected. You can remove the asterisk (and unselect the item) by pressing the space bar a second time.

The (ALL) item selects all items on the list. Unless the list is small, not all series can be displayed. The (NONE) item is a means of exiting the function without displaying a table.

Move the cursor to XY EARNINGS and press the space bar. Do the same with XY DIVIDENDS and XY BOOK VALUE. With all three marked with an asterisk and the cursor on the XY BOOK VALUE press the RETURN key.

The program lists the union of the ranges of the selected series in the top line of the status area. You are asked to specify whether you want to KEEP that range or CHANGE it. If you decide to CHANGE it, you will be prompted for a beginning and ending date and, if applicable, periods. For this example, press **RETURN** with the cursor on KEEP.

The date is displayed down the left margin of the screen. The series are displayed in the order in which you selected them. The column headings in the bottom line of the status area are shortened to the seven character column width. Longer names are always truncated unless the column width is large enough for the whole name.



The status area gives you the option of continuing or printing the table. If you select CONTINUE, the table is erased and you are returned to the Main VisiTrend menu. If you select PRINT, the amount of the table currently on the screen is printed on your printer. If you are using the printer for the first time during this VisiTrend/VisiPlot session, you are prompted to enter the slot number for the printer control card.

A maximum of 19 periods can be displayed on the screen. If the series contains more than 19 periods, the first 19 are displayed and the remainder are displayed, 19 at a time, when you select CONTINUE. If you want to print a screen of data, you must do it while it is displayed. You can exit from the TABLE function before displaying all points by selecting EXIT. EXIT is not an option if the whole series fits on a single screen. In this case, CONTINUE exits from the function.

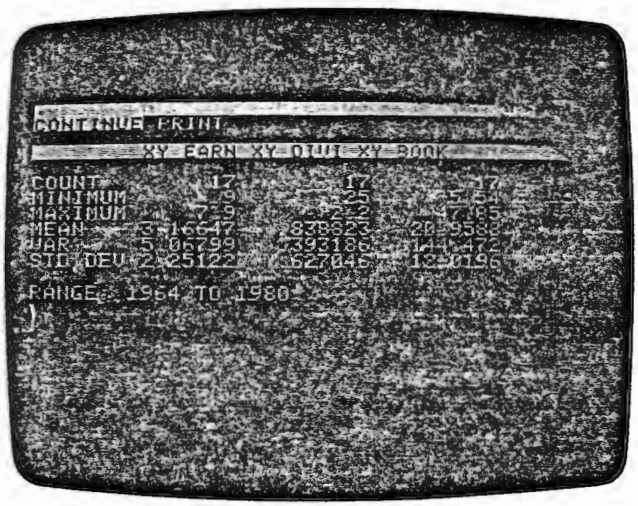
Calculating Series Statistics

The STATS function displays a table of common descriptive statistic measurements. The table includes the count of the number of items use for the calculations, the minimum and maximum value in each series, th arithemetic mean (average), the variance, and the standard deviatio If more than one series is selected, it also calculates the coefficients c correlation between all combinations of selected series.

Move the cursor to ANALYZE and press RETURN. Then move the curs to STATS and press RETURN. The function displays the list of series just c TABLE did. Select XY EARNINGS, XY DIVIDENDS, and XY BOOK VALUE wit the space bar just as you did for TABLE. Now press RETURN.

The range is displayed and you have the option of keeping this rang or changing it. The range used by the STATS function is the intersection c the ranges of the selected series, not the union of ranges as the TABL function used. Press RETURN with the cursor on KEEP.

The message COMPUTING... is displayed in the status area. When th computations are complete, the calculated values are displayed i columns with the series name at the top. The meaning of each value listed in the left hand column. The range that the data covers is listed the bottom of the table.



You have the option of printing the statistics or continuing. If you do n print them, you will have to rerun the function to obtain them again.

With the cursor on CONTINUE press RETURN. The COMPUTING... message appears again. The function is calculating the coefficients of correlation between the three selected series. When the computation is complete, they are displayed in a matrix as shown in the photograph.

Again you have the choice of printing the coefficients or continuing. Press RETURN with the cursor on CONTINUE. You are returned to the Main VisiTrend menu.

Performing A Linear Multiple Regression

The final option on the ANALYZE menu is REGRESS, which does a linear multiple regression (least squares). Multiple regression is a method of developing a formula that relates a single variable (called the dependent variable) to one to five other variables (called the independent variables). The resulting equation should explain the dependent variable in terms of the independent variables and a constant.

The VisiTrend/VisiPlot REGRESS function accepts a maximum of five independent variables. The function requires, as a minimum, as many data points as there are independent variables.

There are many common uses of this technique. It is used to forecast the output of one industry on the basis of the output of another industry. For example, we should be able to assume that the steel industry follows the performance of the auto industry. It is used to forecast the performance of a stock in terms of the measures of the economy.

The technique develops a constant (K) and coefficients (C_n) for each independent variable ($V_{n(i)}$) such that a point in the dependent variable ($D_{(i)}$) is approximated from the corresponding period data in the independent variables according to the formula:

$$D_{(i)} = K + C_1V_{1(i)} + C_2V_{2(i)} \ldots + C_nV_{n(i)}$$

NOTE: You can do exponential and other types of regressions by using the XFORM function to convert series to a form acceptable for a linear multiple regression.

REGRESS also calculates and displays the following statistical measures of a linear multiple regression. These include the T-statistic, the R-Bar Squared statistic, the corrected R-Bar Squared statistic, the Standard Error for the regression and for the coefficients, the sum of the squared residuals, the F-statistic, and the Durbin-Watson statistic.

The REGRESS function generates two new series. The first is a fitted series developed from the generated constant and coefficients. The second is a series of the differences (residuals) between the actual dependent series values and the fitted values. The new series have the same name as the dependent series with a qualifier appended to the name. The qualifiers are listed in the following table.

Qualifier	Purpose	Comments
.Fn .Rn	Fitted series Residual series	n is a program generated number. n is the same for the fitted and residual series from a single regression.

Move the cursor to ANALYZE and press RETURN and then to REGRESS and press RETURN.

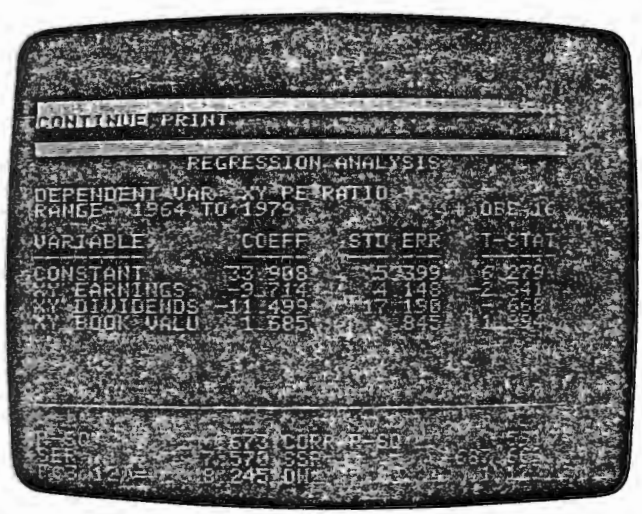
The list of series in memory is again displayed. The status area directs you to select a dependent variable. For this example move the cursor to XY PE RATIO and press RETURN. This example tests to see if the price/earnings ratio can be explained by the earnings, dividends, and book value. Move the cursor to XY PE RATIO and press RETURN.

The list is erased and immediately redisplayed. This time the status area instructs you to select the independent variables. You can select from one to five series as independent variables. The independent variables must have the same period as the dependent variable. Move the cursor to XY EARNINGS and press the space bar. Do the same for XY DIVIDENDS and XY BOOK VALUE. Now press RETURN.

The intersection of the ranges of the dependent and independen variables is displayed in the top status area line. You have the option o using this range or changing it. There must be at least as many points ir the range as there are independent variables. For example, if you selec four independent variables, there must be four data points in the inter· section of the ranges of the dependent and independent variables. Press RETURN with the cursor on KEEP.

You now have the option of generating the regress with or without a constant. Select CONSTANT.

The COMPUTING... message is displayed in the status area. It can take anywhere from 15 to 60 seconds or more to do the regression. The time increases as the number of data points and number of series increases. When the computation is nearing completion, the regression analysis is displayed as shown in the photograph.



The Durbin-Watson statistic (DW) is the last item calculated. If there is not enough room for the fitted and residual series, they are not created and the Durbin-Watson statistic is not calculated. The message NO ROOM FOR REGRESSION VALUES is placed in the status area.

You have the option of printing the regression analysis. If you choose not to print it, the data is lost. You must run the regression again if you want the data at a later time. For this example, select CONTINUE to proceed without printing.

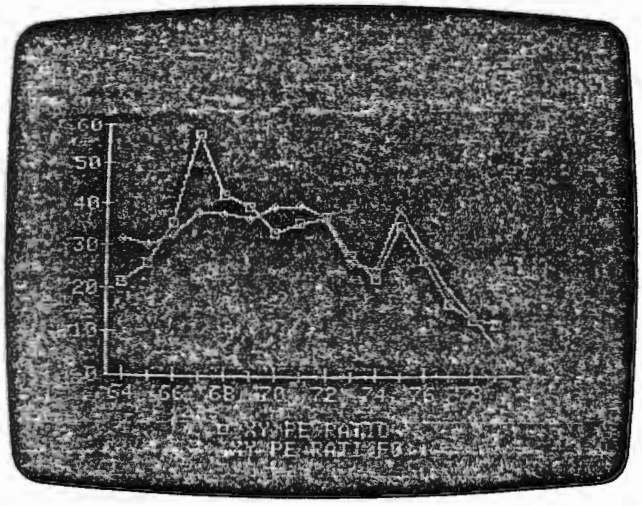
Next you are asked if you want to save the series containing the fitted and residual values. If you select NO, the series are discarded and you must do the regression again if you want them at a later time. Select YES to save the series.

The REGRESS function exits to the Main VisiTrend menu.

Move the cursor to LOOKUP and press **RETURN**. Note that the bottom two items on the LOOKUP list are XY PE RATI.Fn and XY PE RATI. Rn. The number on the end is program supplied; it will be the same for both series.

To see the newly created values, select ANALYZE and TABLE. Select XY PE RATIO, XY PE RATI.Fn, and XY PE RATI.Rn. The values are displayed with their date. Note that the long similar series names are abbreviated to the same name: XY PE RA. With long names and narrow column widths you must sometimes remember the order in which you selected the series.

The following photograph shows a VisiPlot line chart of the actual dependent data and the fitted data plotted together.



Trend Forecasting With the Regress Function

The REGRESS function also does trend forecasting. It calculates the best straight line fit for the dependent variable. You are prompted for the number of periods to forecast. The fitted straight line is extended for the specified number of periods.

The function generates the same displays and series that are generated in the multiple regression: the regression analysis, the fitted series, and the residual series.

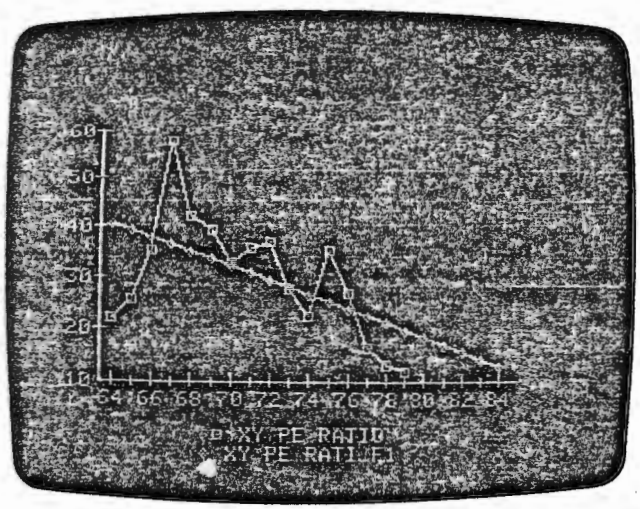
Before beginning this function, select the CLEAR function. Remove the previous fitted and residual series. Move the cursor to the names and press the space bar and then press RETURN. You must have at least two free series in memory to complete the REGRESS function. If there is not enough room for the two generated series, the message NO ROOM FOR REGRESSION VALUES! is issued and the functions ends before calculation of the Durbin-Watson statistic.

To generate a five period forecast of the XY PE RATIO series, select ANALYZE, REGRESS, and XY PE RATIO. When the prompt to select the independent variables is displayed, the bottom item in the list is (TREND). Move the cursor to (TREND) and press RETURN. You cannot include any series as independent variables when doing a trend forecast.

Next you are prompted to specify a number of periods to forecast. Enter 5 and press RETURN. When the range prompt is displayed, select KEEP to use the range of the dependent variable.

The status area contains the COMPUTING... message and after several seconds, the regression analysis display begins.

You can CONTINUE or PRINT the analysis. Finally, you are asked if you want to save or discard the fitted and residual values. If you save the series and plot the fitted series with the actual series, you will get the following chart.



USING FUNCTION

The items in the FUNCTION menu each generate a new series. Before selecting FUNCTION, make sure there is at least one free series. You will get the NO MORE ROOM! error message if there are no free series.

Each function generates a new series that has the name of the source series with a qualifier added to the end of the name. The qualifiers for each function are:

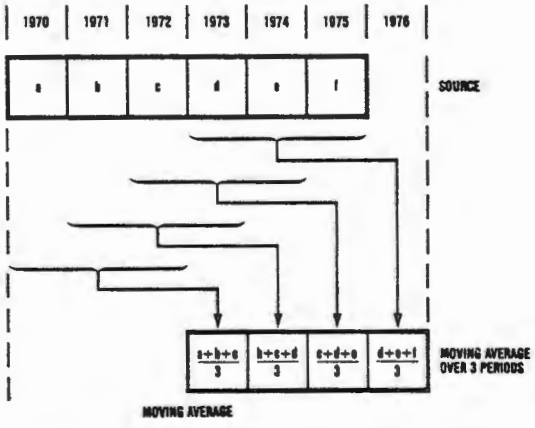
FUNCTION	QUALIFIER	COMMENT
Moving Average	.Mn	n = number of periods averaged
Smoothing	.S	
Percent Change	.%	
Lag	.−n	n = number of periods lagged
Lead	.+n	n = number of periods leading
Total	.T	

The FUNCTION menu items all operate in a similar manner. After selecting the function, you are prompted to select the source series from the series in memory. Some functions require no further input while others prompt for an additional factor. This lesson contains a sample use of the moving average function after each function is described.

Moving Average

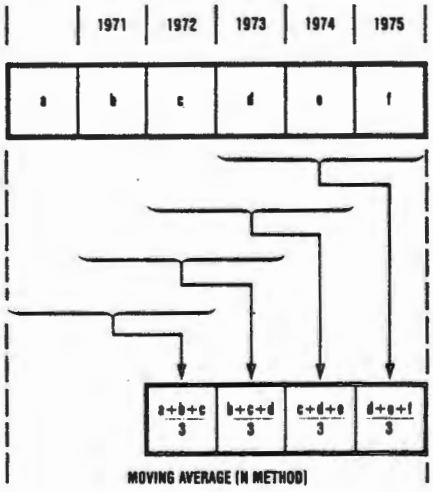
The MOVE AVG function calculates the moving average of the sourc function for a specified number of periods. There are three commo methods of calculating the moving average:

- The N+1 method (used in the VisiTrend program) which locates th first point of the moving average series one point beyond the numbe of periods being averaged as shown in the drawing.



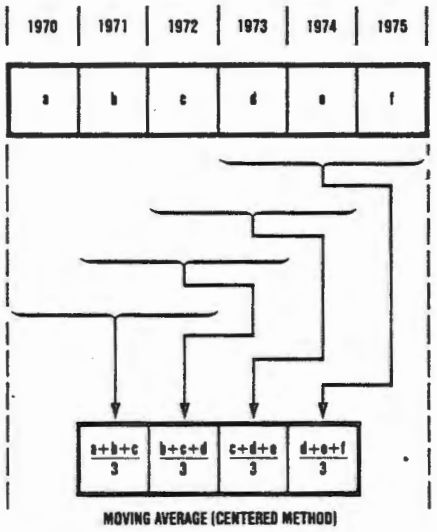
003-0

- The N method which locates the first point of the moving averag series at the last point of the periods being averaged as shown in th drawing.



003-0

- The Centered method which locates the first point of the movin average series at the center of the periods being averaged as show in the drawing.



003-00

The moving average is essentially a smoothing technique. A commor use of this function is to remove the noise or seasonal factors from monthly or quarterly data. For example, if you have monthly sales data for severa years and want to see the trends without the month to month fluctuations you can generate a moving average over a 12 month period. For quarterly data that contains seasonal noise, you would generate a moving average over a four quarter period.

You are prompted for the number of periods.

Smoothing

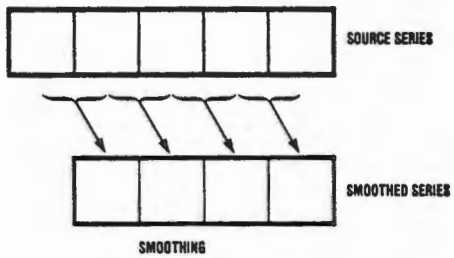
The SMOOTH function performs a single exponential smoothing of the source series. The forcast generated by this technique is based on the most current data point and current forecast.

You are prompted for a smoothing factor (α) which must be greater than 0 and less than 1. The smoothed series is calculated with the formula:

$$Y_{(i)} = \alpha X_{(i-1)} + (1-\alpha) Y_{(i-1)}$$

where $X_{(i)}$ are points in the new series, $Y_{(i)}$ are points in the source series and n is the smoothing factor. A high factor gives greater weight to the more current point, and a low factor, to the earlier point. The generated

series lags the source series by one period as shown in the figure. This lag is a one period forecast for the data in the source series.



Percent of Change

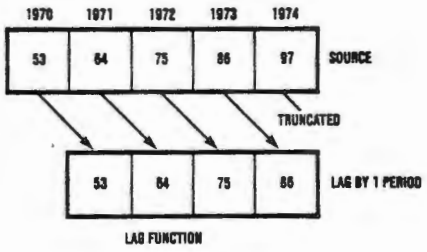
The % CHANGE function calculates the percent of change between date n and n+1 and puts the value at date n+1 in the new series. This function lets you evaluate the change in related values rather than trying to compare divergent magnitudes in the original values. For example you may generate percent of change series for sales and cost-of-selling data. The original data may look like there is a low correlation when in fact the percent of change shows a positive cause and effect relationship.

Lag

The LAG function shifts the values in the source series a specified number of periods to the future in the new series. A common usage of this technique is to align data in time in a meaningful fashion. For example if you spend X dollars on advertising in January the effect of the expenditure will be seen in February sales. The LAG function shifts the advertising expenditures in time where they can be evaluated against the sales the prompted, that is:

Sales(n) = f(Advertising expenditure(n−1))

You are prompted to specify the number of periods to be lagged. The new series begins the specified number of periods later than the source series. The new period ends on the same date as the source period. Data points shifted beyond the end date are lost to the new series. The following figure shows the effect of a three period lag on a series.

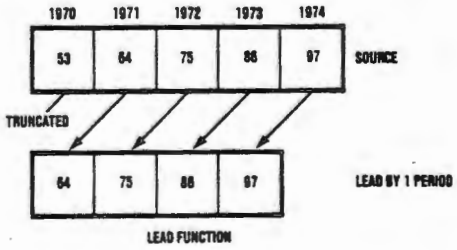


003-001

Lead

The LEAD function shifts the values in the source series a specified number of periods to the past in the new series. This function is the reverse of the LAG function. In the preceding example, it would allow you to shift the sales data back to the expenditure of advertising dollar for evaluation.

You are prompted to specify the number of periods. The new series begins on the same date as the source series. The new series ends the specified number of periods before the source series. Data points shifted beyond the beginning date are lost to the new series. The following figure shows the effect of a three period lead on a series.



003-002

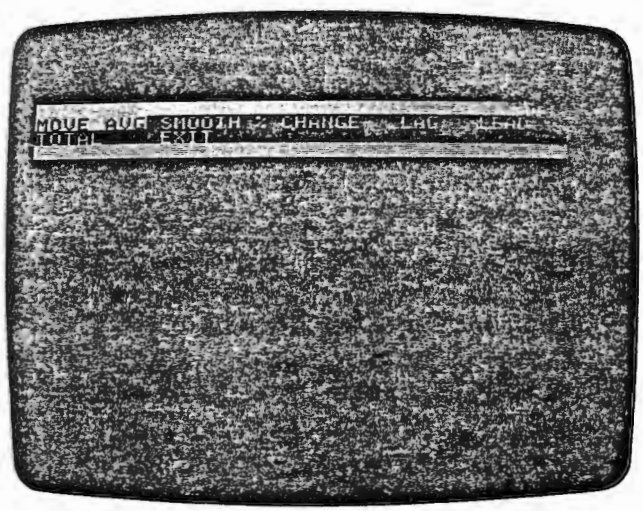
Totaling a Series

The TOTAL function calculates the running total of the points in the source series. A given point in the new series is the total of all preceding points in the source series. The most common usage of this function is to generate year-to-date totals of monthly or quarterly data.

FUNCTION EXAMPLE

This is an example of the use of the MOVE AVG function. Before starting, move the cursor to LOOKUP and press RETURN. There must be at least one free series in memory. If you already have 16 series in memory, remove one with the CLEAR function.

After assuring there is room for a new series, move the cursor to FUNCTION and press RETURN. The FUNCTION menu is displayed.

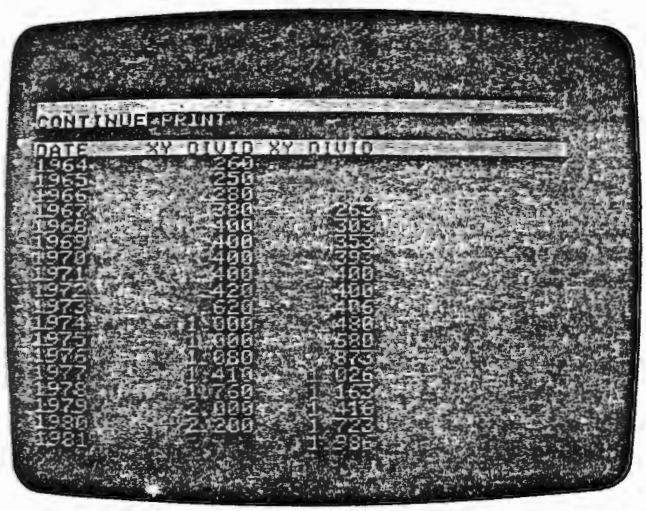


The first item (under the cursor) is MOVE AVG. With the cursor on this item, press RETURN. You are prompted to select a series on which to calculate the moving average. Move the cursor to XY DIVIDENDS and press RETURN. Next you are asked to enter the number of periods over which the average is to be calculated. Enter 3 and press RETURN.

The status area reads PLEASE WAIT... while the new series is being calculated. When the function is complete, you are returned to the Main VisiTrend menu.

Move the cursor to ANALYZE and press RETURN and then to TABLE and press RETURN. Move the cursor to XY DIVIDENDS and press the space bar. Then move the cursor to the new series at the end of the list with the name XY DIVIDEN M3 and press the space bar. Now press RETURN. When prompted about the range, select KEEP.

The following photograph shows the table of the two series.



Note that the series names are truncated to fit the column size. When you have long names you have to remember the order in which you selected the series; they are listed in the selected order.

HOW TO CONVERT AN N+1 MOVING AVERAGE

You can convert the VisiTrend N+1 moving average to an N or Centered moving average.

Converting to an N Moving Average

To create to an N moving average, first perform the N+1 moving average for the desired number of periods. You must then move the Mn moving average back in time by one period. Then invoke the EDIT function and select the moving average series. Press ESC to display the Edit Command menu. Select SPECS from the menu and then select START from the Specs menu. When prompted for the new start date, specify a date one period earlier than the current start date. For example, if the start date is 1966, change it to 1965. If the start date is 1966, period 4, change it to 1966, period 3.

You can also shift the N+1 moving average series with the LEAD function. The only disadvantage to this is the loss of one period off the front of the modified series (see the description of the LEAD function).

Converting to a Centered Moving Average (odd period)

To convert to a Centered moving average is more complicated in some circumstances. The complexity depends on the number of periods being averaged. If the average is over an odd number of periods, the moving average must be moved back to the middle of the number of periods being averaged. The N+1 moving average series must be moved backward (n+1)/2 periods, where n is the number of periods being averaged.

Converting to a Centered Moving Average (even period)

When the number of periods being averaged is even, the conversion to a Centered moving average is more complex. Follow this procedure:

1. Perform the N+1 moving average.
2. Move the new series backward in time by (n/2)+1 periods, where n is the number of periods being averaged.
3. Perform another N+1 moving average on the series resulting from step 2.
4. Move the series resulting from step 3 backward in time by 1 period.

WRITING YOUR OWN SERIES TRANSFORMATION

While the FUNCTION and ANALYZE options offer a large set of series data manipulation functions, they cannot meet all your needs. This function allows such operations as the conversion of exponential values to first order values for inclusion in a linear multiple regression. For example, if you think that there may be a meaningful correlation such that:

$Y = f(x^2)$

You can transform the x^2 values to first order values with the XFORM formula $EXP(x^2)$ which gives a value that is valid for the VisiTrend REGRESS function.

The XFORM function lets you write your own transformation formula. The formulas are limited to two lines (80 characters). You have the use of the following mathematical, logical, and comparative operators in writing your transformation formula:

- Mathematical operators—+ (addition), − (subtraction), * (multiplication), / (division), and ^ (exponention).
- Logical operators—AND, OR, and NOT.
- Comparative operators—< (less than), <= (less than or equal), = (equal), > (greater than), and >= (greater than or equal).

You can use parentheses to control the execution order of the formula. All operations in parentheses are performed before the operations outside the parentheses. All parentheses must be balanced or an error will occur.

In addition to the mathematical, logical, and comparative operators, you have the following Applesoft functions:

- SGN—Sign
- INT—Integer part of
- SQR—Square root
- LOG—Natural logarithm
- EXP—e to the power of
- RND—Random number between 0 and 1
- ABS—Absolute value of
- SIN—Sine
- COS—Cosine
- TAN—Tangent
- ATN—Arctangent

The Applesoft functions are used just as they are used in a Basic program. The only difference here is that you can use a series as the variable on which the function operates. In this case the function is performed on each data point in the series. For example, SQR(XY EARNINGS) generates a series with the same beginning and ending dates and period. Each data point in the new series is the square root of the corresponding data point in XY EARNINGS.

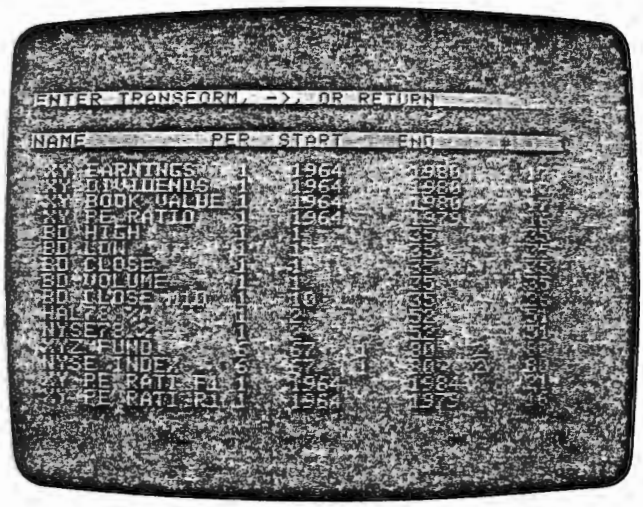
You can include series names in your transformation formula. The function displays the list of series currently in memory. You select a series by pressing the right arrow key which moves the cursor into the list of series. Then you move the cursor to the desired series and press RETURN. Do not type the name of a series; an error results if you type the series name into the formula.

The following example creates a new series with the name BD AVG. The series is the average of the daily high and low stock prices contained in the series DB HIGH and DB LOW.

Before beginning the example, use the LOOKUP function and make sure there is a free series space in memory.

Move the cursor to XFORM and press RETURN. The function prompts for a name for the series that will hold the transformed data. Enter DB AVG and press RETURN.

A list of the series in memory is displayed. The top line of the status area reads ENTER TRANSFORM, —> OR RETURN. This means that you can enter any transform operator or function from the keyboard, enter a series name by activating the cursor with the right arrow key, or press the RETURN key to indicate that the formula is complete. The transform formula uses all of these.



When you want to erase part of a formula you have entered, press the ESC key. If a series name is in the formula when the ESC key is pressed, it is bracketed by slashes for easier reading. If you press ESC to correct a series name, the whole name is erased with a single press of the key. You do not have to erase each letter of the name.

Enter a left parenthesis. Next press the right arrow key. A cursor appears in the series list. Also the name at the cursor appears in the formula line in the status area. Press the right arrow key again and the cursor moves down and the name in the status area changes. Move the cursor to BD HIGH and press RETURN. The cursor disappears from the list and BD HIGH remains in the formula.

Enter the plus sign (+). Again press the right arrow key. Again a cursor appears and a series name is written in the status area. This time move the cursor to BD LOW and press RETURN.

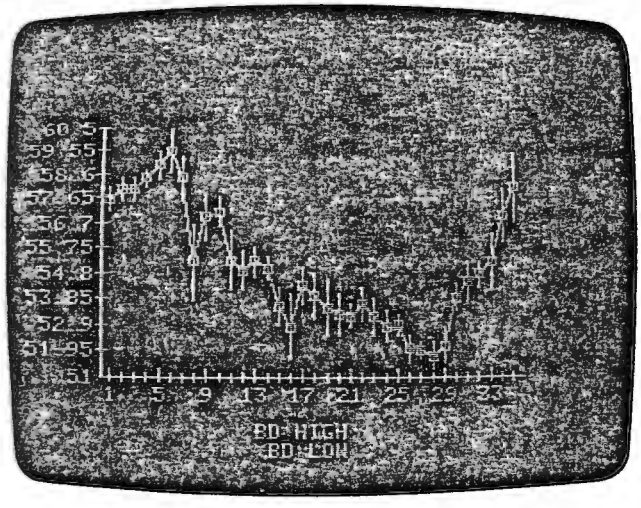
Enter a right parenthesis, slash (for division) and 2. You now have a formula in the status area that reads:

(BD HIGH + BD LOW)/2

To generate a new series from this formula, press the RETURN key. If the last item in the formula had been a series name, you would have had to press the RETURN key twice, once to enter the series name and once to execute the formula.

The PLEASE WAIT... message is displayed while the new series is being generated.

When the function is finished, the Main VisiTrend menu is displayed. Move the cursor to LOOKUP and press RETURN. The list shows that the function created a new series with the name BD AVG. The following photograph shows the new series plotted as a line, overlaying a HI-LO chart of BD HIGH and BD LOW.



CONTINUING WITH THE VISITREND PROGRAM

You should be able to go back to the functions you have used in this lesson and do analysis work on your data. You should be able to use the FUNCTION items that you have not used. Finally, you should be able to SAVE your VisiTrend output on the data diskette and be able to plot the data with the Plot program.

If you are not sure of the use of the VisiTrend functions, review this lesson. For a review of the Plot program see Lesson One, for the Storage Management program see Lesson Two and for the Edit functions see Lesson Three.

For a quick and direct explanation of the functions in all three programs, see the Reference section.

LESSON FIVE

MORE ABOUT PLOTTING

This lesson is a series of step by step examples showing how to make different kinds of VisiTrend/VisiPlot charts. The data series that are used in these examples are stored on the VisiTrend/VisiPlot program diskette under the names GEM PRICES, PRESPREF, and MATH FUNCTIONS.

The GEM PRICES file contains series of the prices of 1 and 2 carat rubies for the years 1974 through 1980, the price of 3 carat sapphires over the same period, the price of a 1 carat investment quality diamond for the years 1967 through 1978, and the Consumer Price Index for the years 1967 through 1978.

The PRESPREF file contains series of political poll data taken at random times during a mythical election campaign.

The MATH FUNCTIONS file contains two series of values for two math functions.

This lesson assumes you have read and used the functions described in Lesson One and Lesson Two covering the Plot and Storage Management programs.

GETTING STARTED

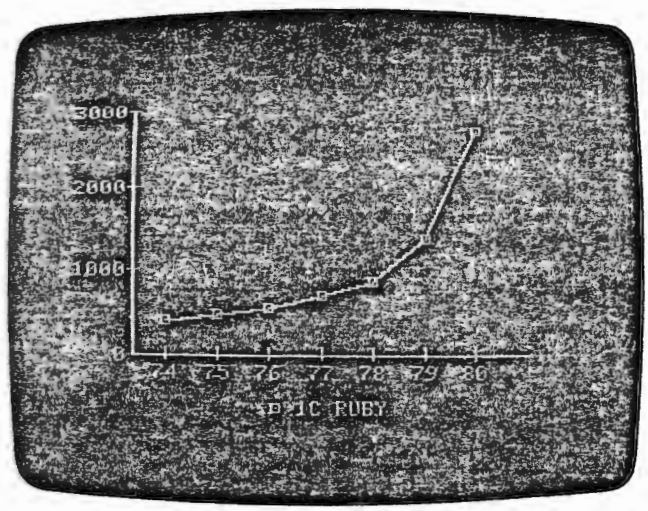
Load the VisiTrend/VisiPlot program and then LOAD the GEM PRICES, PRESPREF, and MATH FUNCTIONS files from the program diskette. Call the Plot program. If you have trouble with any of these operations, review Lesson Two.

This lesson shows how to generate many different charts and how to combine charts. The sections begin with a picture of the chart that is to be generated. The picture is followed by a list of the keys you must press to generate the chart. A key name preceded by a word or phrase enclosed within parentheses indicates a cursor position you must make before pressing the indicated key. A word or phrase in quotation marks preceded by the word Enter indicates that the word or phrase must be typed. For example:

- SPACE BAR—means press the space bar.
- RETURN—means press the RETURN key.
- (LINE) RETURN—means move the cursor to LINE and press the RETURN key.

- Enter "PERCENT OR TOTAL" RETURN—means enter the phrase at the keyboard and press the RETURN key.

SINGLE LINE CHART



Beginning in the Select menu:

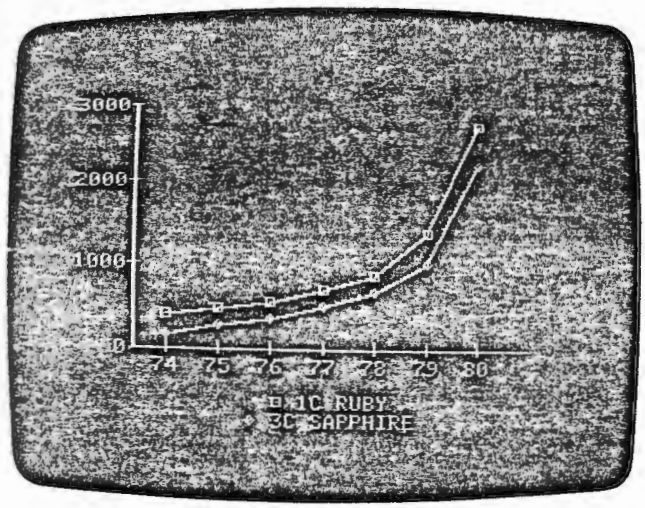
(LINE) **RETURN**

(1C RUBY) **RETURN**

(PLOT) **RETURN**

There is nothing new in this chart except the data. You generated several single line charts like this one in Lesson One.

TWO LINE CHART



(NEW) **RETURN**

(LINE) **RETURN**

(1C RUBY) **SPACE BAR**

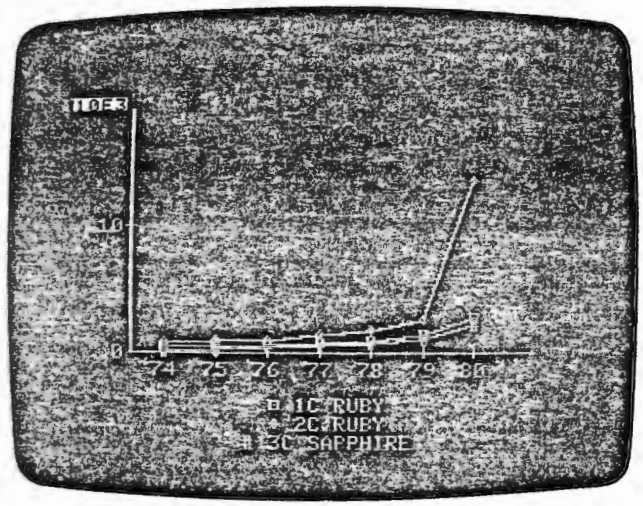
(3C SAPPHIRE) **RETURN**

(PLOT) **RETURN**

There are a couple of new things in this chart. First the chart contains two lines instead of one. The two lines are plotted with different symbols—the square box which you saw in Lesson One and a diamond shaped symbol. The legend at the bottom of the chart lists both series and shows what plotting symbol was used for each. The bottom line of the status area lists the last series selected and now contains an ellipsis following the type of chart. The Ellipsis indicates that multiple series were selected.

Note that both series were selected before the plot was drawn.

THREE LINE CHART



(NEW) **RETURN**

(LINE) **RETURN**

(1C RUBY) **SPACE BAR**

(2C RUBY) **SPACE BAR**

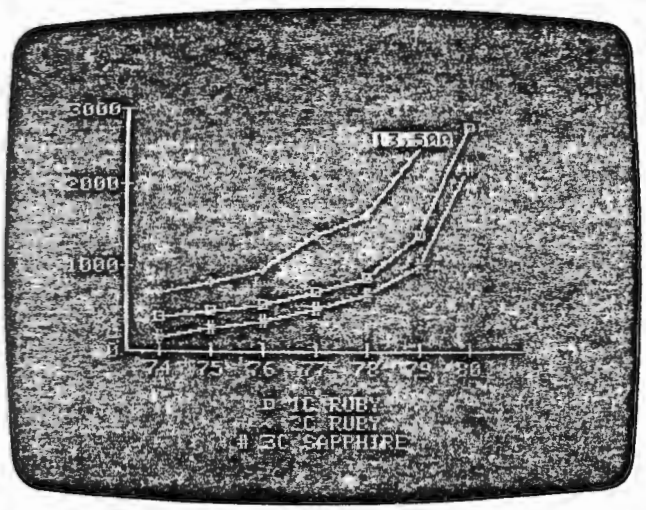
(3C SAPPHIRE) **RETURN**

(PLOT) **RETURN**

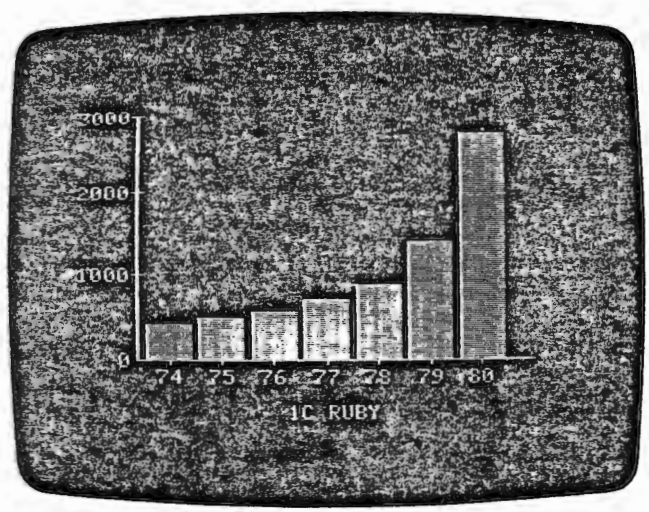
The new feature of this chart is the use of the pound sign (#) as the plotting symbol of the third series. Note that the Y-axis scale has a factor of 10E3 (or 1000) at the top, indicating that Y-axis labels must be multiplied by 1000.

This chart is difficult to read. The information for the years 1974 through 1979 is crammed together in a small space. The only thing that shows up well is the 1980 price of 2 carat rubies. This chart may be satisfactory if its purpose is to show what happened to the price of 2 carat rubies in 1980. However, if the other information is equally important, it might be a good idea to change the range to 1974 through 1979 and handle the 1980, 2 carat ruby price in some other manner.

Another approach is to change the scale to show the earlier data clearly and let 1980, 2 carat ruby price go off the chart and show its value with a moveable title. This is the approach used in the following photograph.



SINGLE BAR CHART



(NEW) **RETURN**

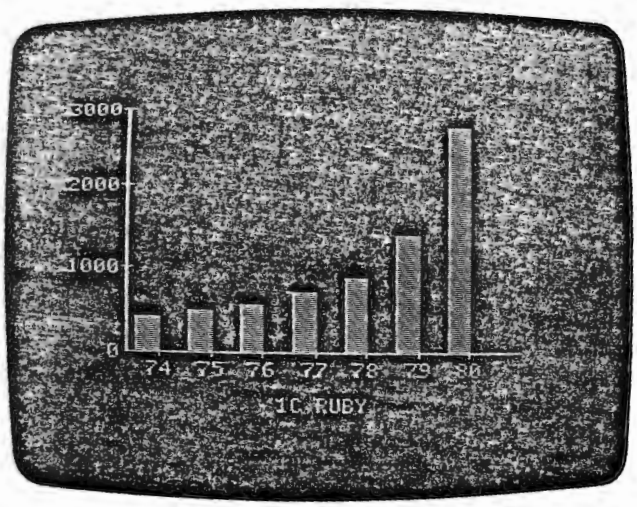
(BAR) **RETURN**

(NORMAL) **RETURN**

(1C RUBY) **RETURN**

(PLOT) **RETURN**

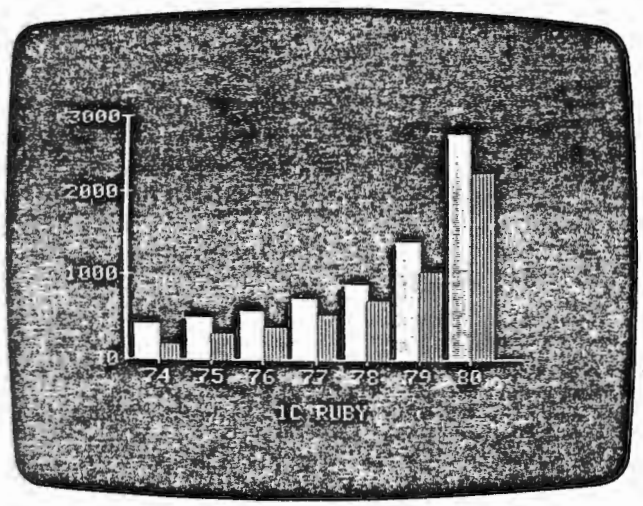
Again, this chart is no different than the bar charts you did in Lesson One. It can be made different by selecting half-width bars. Repeat the sequence and select LEFT instead of NORMAL when the Bar menu is displayed.



The only differences in the chart are the width of the bars and the bottom line of the status area which says BAR-LEFT where it said BAR on the chart with full-width bars.

The half-width bars are used for comparative charts as shown in the next example.

COMPARATIVE BAR CHART



(NEW) **RETURN**

(BAR) **RETURN**

(LEFT) **RETURN**

(1C RUBY) **RETURN**

(PLOT) **RETURN**

(SELECT) **RETURN**

(BAR) **RETURN**

(RIGHT) **RETURN**

(3C SAPPHIRE) **RETURN**

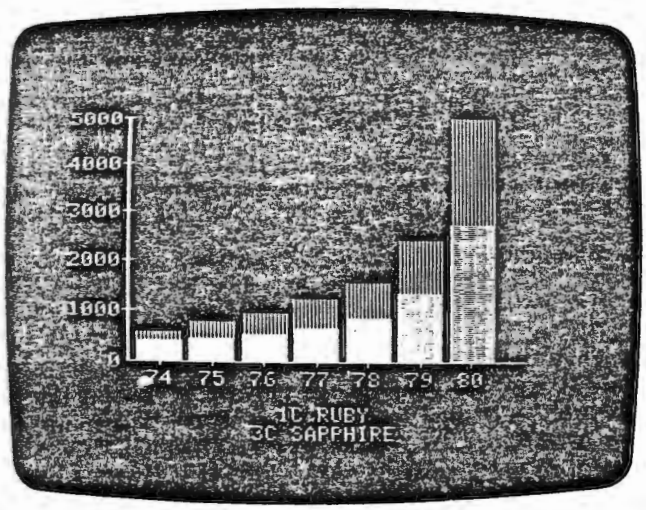
(OPTIONS) **RETURN**

(COLOR) **RETURN**

(GREEN) **RETURN**

(OVERLAY) **RETURN**

There are many differences in the appearance of this chart and in the making of it. First, instead of choosing both series and plotting them as was done with multiple line charts, you selected each series on a separate pass through the Select menu. If you had chosen the two series at the same time (as you did for the two line chart), you would get a different chart. When the series are chosen on the same pass through the Select menu, the chart shows the series stacked on top of each other as shown in the following photograph.

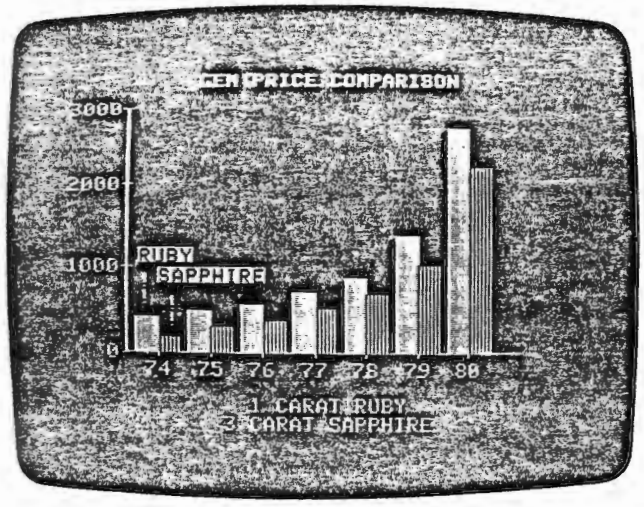


Generating the chart in this way, the two values are added. You will use this style of bar chart when you are interested in the sum of the two series.

To add the second series to the first chart, you used the OVERLAY function rather than the PLOT function. OVERLAY draws the new chart on top of the existing chart. It uses the same range and scale as the existing chart.

You also changed the color of the second set of bars. If you had not, both sets of bars would have been the same color and wouldn't have shown up as clearly. Instead of changing the color you could have changed the format of the second bars to outlined or shaded.

Overlaying a chart does not put a legend at the bottom. You must add that yourself with the TITLE options. You should put in the names of both series and specify which is which as shown in the following picture.



Note that the horizontal grid lines make the values at the right side of the chart easier to read.

You may see a slight overlay between the bars in a comparative bar chart. You may also see a slight offset between the upper and lower bars a stacked bar chart. Both of these conditions are caused by the Apple II color techniques.

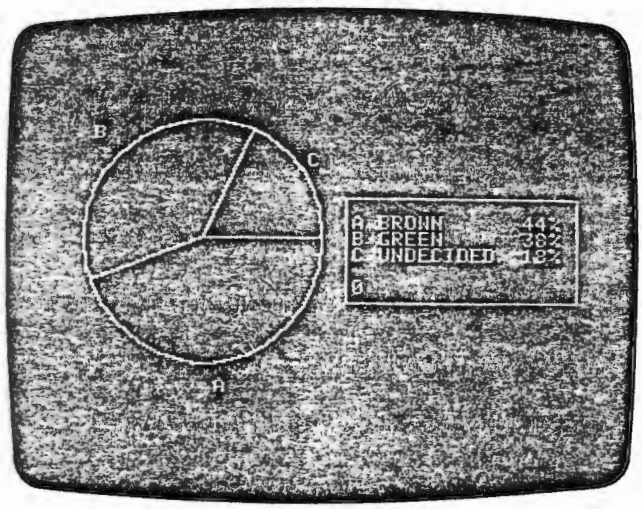
THE PIE CHART DATA

In the following sections you are going to draw pie charts. The data is from the file named PRESPREF that you loaded at the beginning of this lesson. The charts use four series, the ones named BROWN, GREEN, WHITE, and UNDECIDED. Each series has two data points. The first data point in each series represents the percent preference for each candidate in a 2-way Brown-Green race (the White value is 0). The second data point in each series represents the percent preference in a 3-way race of all candidates.

The data used in pie charts does not have to represent a time series. The value of the zero data point represents one set of circumstances and the value of the 1st data point represents another. In this case the dates represent data items that are not necessarily related by time.

A pie chart shows a single point in time and not a comparison of different points in time as our other charts have. The VisiTrend/VisiPlot program requires that the different values used in pie charts be from different series. All the values must be at the same date or reference number. The plotting fails if any of the series do not have the specified date.

A PIE CHART



(NEW) **RETURN**

(PIE) **RETURN**

(BROWN) **SPACE BAR**

(GREEN) **SPACE BAR**

(UNDECIDED) **RETURN**

Enter "0" RETURN

Note that the WHITE series was not included. It wasn't needed because point 0 has a value of 0. If you had included the WHITE series, it would have been listed in the legend with a zero percentage and would have a segment of the pie.

Each segment of the pie is labeled with a letter. The letter refers to the items in the legend. This order of the series around the pie and in the legend is significant, it is the order in which you selected them. If you had selected them in the opposite order, they would be listed in the opposite order and would have different relative positions on the pie. The first series always begins at the 3 o'clock position and extends in a clockwise direction.

The bottom line of the legend contains a zero. This is the date or reference number of the selected data.

Shading and Titling a Pie Chart

The generation of a pie chart follows a fixed series of events. After drawing the chart you are sent directly to the Title menu. Following the Title menu, you are given a chance to shade the chart. Then you have another chance at the Title menu. There are two passes at the Title menu because it is possible to cover a title with shading. When you exit the Title menu the second time, you have finished. There is no way back to the Title or shading functions. If you made a mistake, you must start over from the beginning.

When the chart is finished, you have a screen with the picture and legend. Press RETURN and the Title menu appears. For now, press EXIT and proceed to the Shading function.

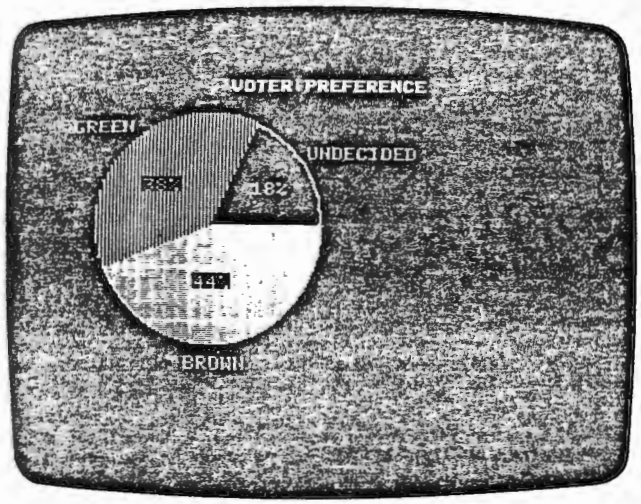
The Shading function asks you to enter a letter or RETURN. It is asking for a letter indicating a segment of the pie. You can specify the labels in any order; you can skip any you don't want shaded. If you change your mind, you can change the color of a segment you have already shaded.

Enter A and press RETURN. The Color menu is displayed. If you have a color display unit, you can choose any color. If you have a black and white display unit, you should limit your selections to black, white, and one other color. All other colors look the same in black and white. For now, select WHITE and press RETURN. Segment A is filled in.

You are asked for another letter. Enter B and press RETURN. This time select GREEN and press RETURN. The B segment is filled in. Leave the C segment as it is—black. Press RETURN. You are asked to confirm that you want to leave the shading function. This confirmation is necessary because you have only one chance to shade the chart. Once you leave this function you cannot get back to it without starting the chart over from scratch.

Enter Y and the Title menu reappears.

With one exception to be covered later, the Title functions operate exactly as they did when you titled a chart in Lesson One. Use that experience and put in the titles to make the chart look like the following picture.



The legend doesn't add much to the chart with all of the legend information on the chart itself. With a pie chart, the LEGEND function erases the legend. Whereas the LEGEND function returned the legend in other charts, it erases the legend in pie charts. Select LEGEND and press RETURN. You should remove the legend before locating titles anywhere to the right of the left side of the legend. That entire side of the screen is erased to eliminate the legend.

To try your hand at another pie chart, use the same three series plus the WHITE series and use data point 1.

DISPLAYING TWO CHARTS AT ONCE

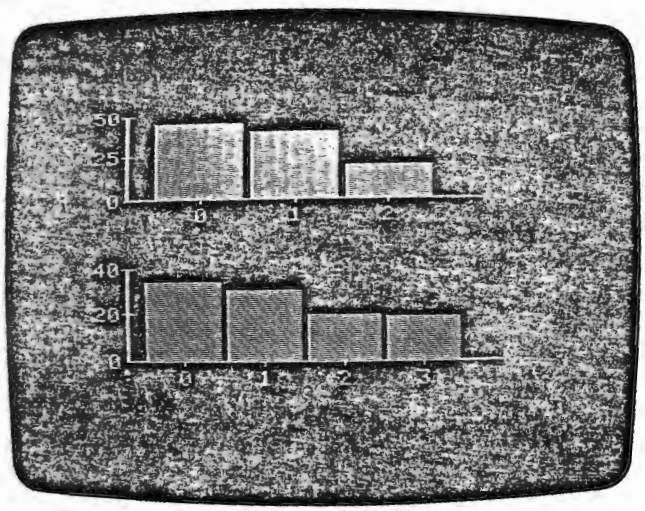
The same data you used for the pie charts is also available in a different form in the series 2 MAN RACE and 3 MAN RACE. All the 0 points are in 2 MAN RACE and the 1 points are in 3MAN RACE. It is often desirable to show the different forms of data at the same time, in two different charts.

The WINDOW function in the Main Plot menu provides this capability. It divides the screen into two parts. You can draw different charts in each window. You can put any kind of chart into the windows except the pie chart. A pie chart requires the whole screen.

The WINDOW menu gives you the choice of dividing the screen into side by side or top and bottom sections. This example uses top and bottom sections. The WINDOW menu also lets you switch between the windows and provides a means to return to single window operation.

When you enter the Window function, the active window is the top one if you chose HORIZ windows and the left window if you chose VERT windows.

When you switch between windows, you lose the current active series and option data for the window you are leaving. When you return to the window, you must start over if you want to change an option and rePLOT the chart.



The following series of commands assumes that you are beginning from the Select menu.

(NONE) **RETURN**

(WINDOW) **RETURN**

(HORIZ) **RETURN**

(BAR) **RETURN**

(NORMAL) **RETURN**

(2 MAN RACE) **RETURN**

(PLOT) **RETURN**

RETURN

(WINDOW) **RETURN**

(SWITCH) **RETURN**

(SELECT) **RETURN**

(BAR) **RETURN**

(NORMAL) **RETURN**

(3 MAN RACE) **RETURN**

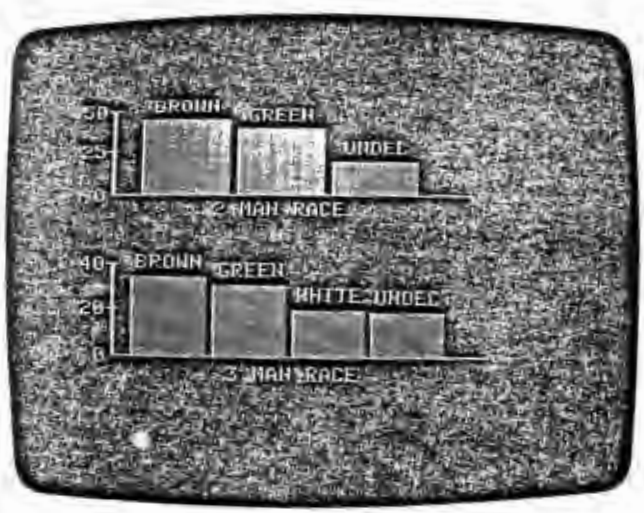
(PLOT) **RETURN**

There are several things to note in the creation of these charts. When you are working in one of the windows, the window is indicated by a code in the extreme right hand end of the bottom status line. The code begins with W for window and T for top or B for bottom. If you use side by side windows, the codes are R for right and L for left.

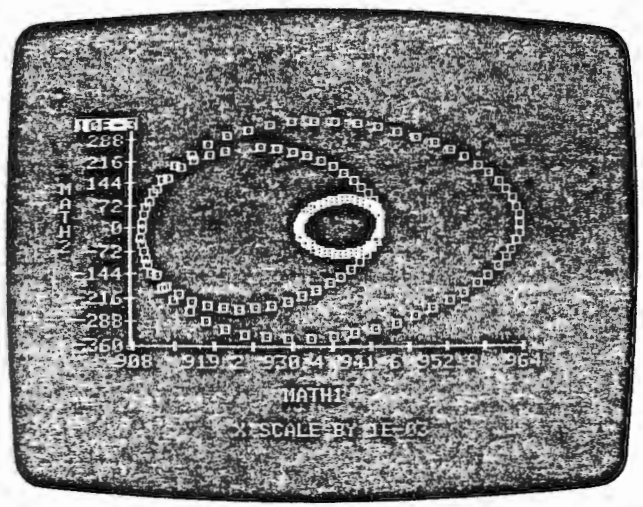
Legends are not included in charts drawn with the WINDOW function. You must create any required legends with the TITLE functions. Also, note that the range for these charts is not very meaningful. You can include the meaning of the numbers in the legend or replace them with the names, or at least, a meaningful code, such as B, G, W, and U for Brown, Green, White, and Undecided.

There are two ways to leave the WINDOW function. You can select NEW from the Main menu or NONE from the Window menu.

The following picture shows one of the ways the charts could be used.



A SCATTER CHART



(NEW) **RETURN**

(SCATTER) **RETURN**

(MATH1) **RETURN**

(MATH2) **RETURN**

(PLOT) **RETURN**

This chart does not have a time axis. The Y-axis contains the scale f the MATH2 series and the X-axis contains the scale for the MATH1 seri No lines are drawn in a Scatter chart, only points.

The plotted values are points from the two series with matching dat The first point plotted is the time 1 value from each series, the seco point is the time 2 value, and so on.

The normal use of the Scatter chart is to determine if there is a correl tion between two series. For example, a straight line Scatter chart show direct relationship between the two series. An analysis of the Scatter p terns is beyond the scope of this manual.

A secondary use of the Scatter chart is to plot two sets of values against each other. Normal use of the VisiTrend/VisiPlot program is with time series. To use the program to plot non-time series, you must put the X-axis values in one series and the Y-axis values in another. Then generate a Scatter chart of the two series. You must put the related X- and Y-axis points at the same time point in their respective series.

REFERENCE

This chapter is the VisiTrend/VisiPlot Reference. It describes the menu functions, error messages, and general VisiTrend/VisiPlot concepts.

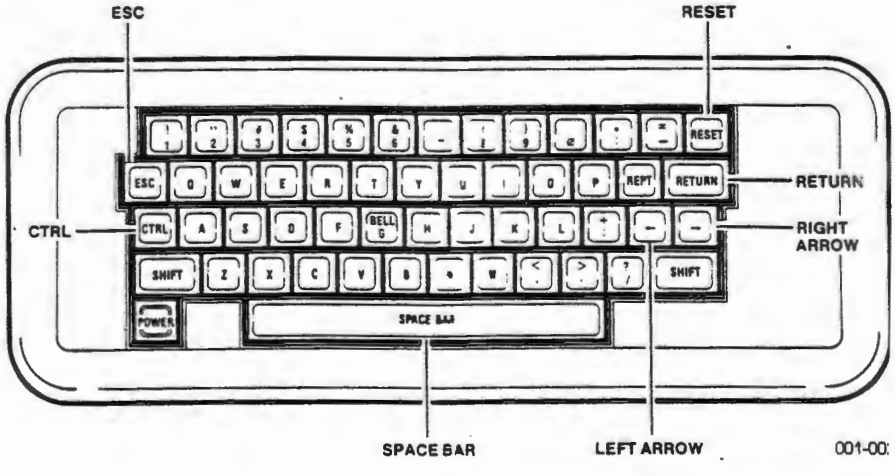
There are sections on Range, Scale, and general usage as well as menu function descriptions and error messages.

LIMITATIONS

The limitations of the VisiTrend/VisiPlot program are:

- Memory holds a maximum of 645 data points or 16 series.
- You can select a maximum of six series for plotting.
- The intersection of ranges of two or more series must contain at least one data point.
- A series can contain a maximum of 150 data points.
- The union of ranges of two or more series can contain a maximum of 150 data points.
- You can select a maximum of five series as independent variables in a linear multiple regression.
- The intersection of ranges in a linear multiple regression must contain at least the same number of points as there are independent variables.
- An XFORM formula cannot exceed 80 characters.

KEYBOARD USAGE



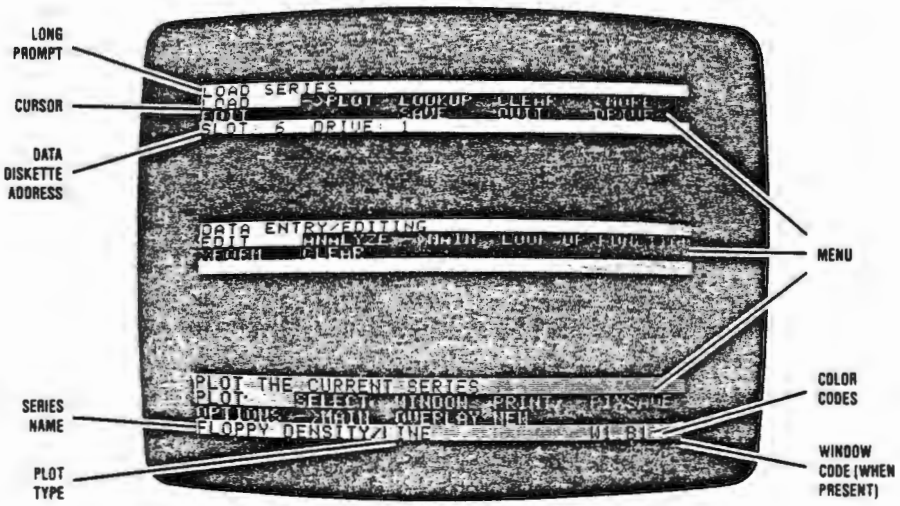
With the VisiTrend/VisiPlot programs, the indicated keys have the following usage:

- The RETURN key issues the command indicated by the cursor in a menu, selects a list item indicated by the cursor, or enters data entered at the keyboard.
- The Space Bar marks and unmarks list items when multiple selection is allowed. When multiple selection is not allowed, the Space Bar performs the same function as the RETURN key.
- The Right Arrow key moves the cursor to the right in a menu and down in a list.
- The Left Arrow key moves the cursor to the left in a menu and up in a list.
- The ESC key corrects errors during data entry by erasing the last displayed character. This key also erases the status area when a chart is displayed.
- The Y key is an affirmative response to the prompts to verify your request when changing programs, deleting files, and exiting the PIE chart shading function.
- The CTRL-C key combination interrupts the printing of a chart or list. CTRL-C should not be pressed except to interrupt a printing operation.
- The RESET key should never be pressed. If it is accidentally pressed the operation in progress is terminated and you are usually returned to the Main menu in the program currently executing—the Main Storage Management menu or Main Plot menu.

RECOVERY FROM AN ACCIDENTAL TRANSFER TO THE MONITOR

If your computer does not have an Autostart ROM installed, pressing RESET will put you in the system monitor. The system monitor displays an asterisk (*) prompt. If this happens, do the following:

1. Type 3D0G and press the RETURN key.
2. If the menu was at the top of the screen, that is if you were in the Storage Management program or the VisiTrend program, type GOTO 1000 and press the RETURN key. If the menu was at the bottom of the screen, that is if you were in the plotting program, type GOTO 20 and press the RETURN key. The GOTO statement should be typed when the Applesoft prompt (]) is displayed at the left side of the screen.
4. If this does not put you back into the correct VisiTrend/VisiPlot program, you must reload the program. DO NOT TYPE RUN TO RECOVER WHEN YOU ARE IN BASIC.



- The Long Prompt gives a longer description of the function to which the cursor is pointing.
- The Cursor indicates a menu item. The indicated item is selected if the RETURN key is pressed.
- The Data Diskette Address indicates the disk drive to which LOAD, SAVE, INIT, and DELETE operations are directed.
- The Plot Type indicates the type of chart that was last selected.
- The Series Name indicates the selected series or the first of multiple series selected.
- The Color Codes indicate the plotting color in use (left) and the background color in use (right). When multiple series are selected, only the first plotting color is shown in the status area.
- The Window Code indicates that the window mode is active and which window is selected: top (WT), bottom (WB), left (WL), or right (WR).

COLOR CODES

Table 3-1 lists VisiTrend/VisiPlot colors, the codes for each that appear in the Main Plot status area, and the black and white representation of the color.

Table 3-1. Color Codes

COLOR	CODE	BLACK AND WHITE REPRESENTATION
Black1	B1	Black
Green	GR	Grey
Violet	VI	Grey
White1	W1	White
Black2	B2	Black
Orange	OR	Grey
Blue	BL	Grey
White2	W2	White

SERIES NAMING CONVENTIONS

The VisiTrend/VisiPlot program creates several series that are permutations of existing series. The program uses the name of the source file with a qualifier appended to the end as the name of the new file. Table 3-2 lists the qualifiers generated by the program and their purpose.

Table 3-2. Series Name Qualifiers

QUALIFIER	FUNCTION	COMMENT
.Fn	Fitted series	n is program generated number.
.Rn	Residual series	n is program generated number.
.Mn	Moving average	n is number of periods averaged.
.S	Smoothed series	
.T	Total series	
.%	Percent change	
.−n	Lagging series	n is number of periods lagging.
.+n	Leading series	n is number of periods leading.

RANGE AND HOW IT IS USED

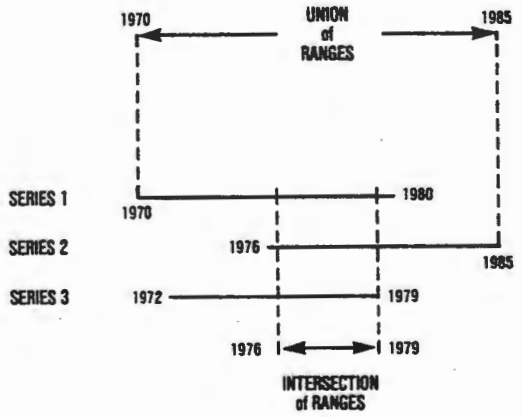
Range is the period of time covered by the chart. The VisiTrend/VisiPlot program plots range against the X-axis (the horizontal axis). The range does not have to be measured in units of time, although it usually is. The range can be a reference number assigned to items. The VisiTrend/VisiPlot documentation treats the range as time bounds because most ranges are measured in time: daily, weekly, monthly, quarterly, or yearly.

The range has two parts, the major range which is usually expressed as years and the minor range or the period. The period divides the range into subparts. You can divide the range into any number of parts from 1 (no division) to 99. Normal uses of the period are to divide the year into months, quarters, or weeks. The use of both the major and minor range is up to you. The major range can be days or weeks or months; it does not have to represent years. Likewise, the period can represent anything you want it to represent.

How the Range Is Calculated

The range is calculated before each PLOT from the date information in the selected series. The range for a single series is the period from the start date to the end date.

The calculated range for multiple series depends on the type of chart being plotted. Line and area charts use the union of the individual ranges. That is, the start date for the chart is the earliest start date in the selected series and the end date is the latest end date in the selected series. Hi-lo, bar, and scatter charts use the intersection of the individual ranges. That is, the earliest and latest dates common to all selected series are used as the range.



Union and Intersection of Ranges 001-006

The maximum number of points in any range is 150 and the minimum is 2. The maximum and minimum apply to all resultant ranges of all selected series.

The pie chart is a special case. A pie chart is a comparison of different items at a single point in time rather than a comparison of the same item at different points in time.

Changing the Range

The VisiTrend/VisiPlot program always determines a range for whatever series are being plotted. There are circumstances where you may want to expand or limit that range. The range you specify must have at least two data points and no more than 150 data points. It must also have at least two data points in common with the selected series.

The RANGE function in the Options menu provides the means of changing the program calculated range.

SCALE AND HOW IT IS USED

Scale is the scope of values plotted against the Y-axis (vertical axis). The scale is totally dependent on the data being plotted. It may be positive, negative, or span the zero point. Its incremental units may be a fraction of a single unit or millions or more.

How the Scale Is Calculated

The program selects a range of values that encompass the highest and lowest values in the series. This range is rounded up or down to values that are round and even. It then sets a number of divisions that result in round and even labels when possible. The number of divisions is usually 10 but other appropriate numbers will occur.

The VisiTrend/VisiPlot program usually does a satisfactory job of figuring out a good scale for your data. There may be times when the values on the scale come out unrounded and generally unaesthetic. When this happens you should use the RESCALE function in the Options menu to obtain more pleasing or meaningful Y-axis labels.

You must enter data in decimal notation as opposed to exponential notation. The program converts large and small numbers to exponential notation for display purposes and specifies a scaling factor at the top of the Y-axis.

Changing the Scale

The VisiTrend/VisiPlot program always determines a scale for whatever series are being plotted. There are circumstances where you may want to expand or limit that scale.

The RESCALE function in the Options menu provides the means of changing the program calculated scale and the number of divisions.

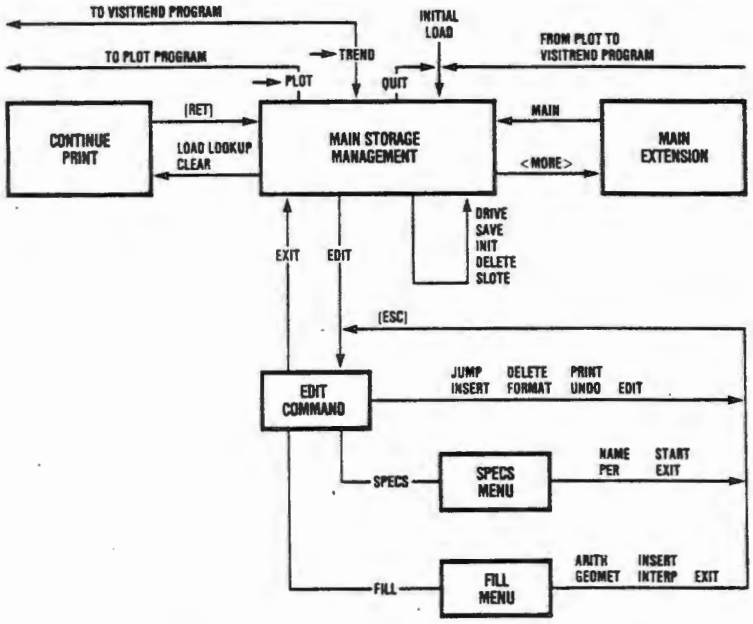
When choosing the number of divisions, subtract the low end of the scale from the upper value and pick a number of divisions that divide evenly into that value.

THE VISITREND/VISIPLOT MENU FUNCTIONS

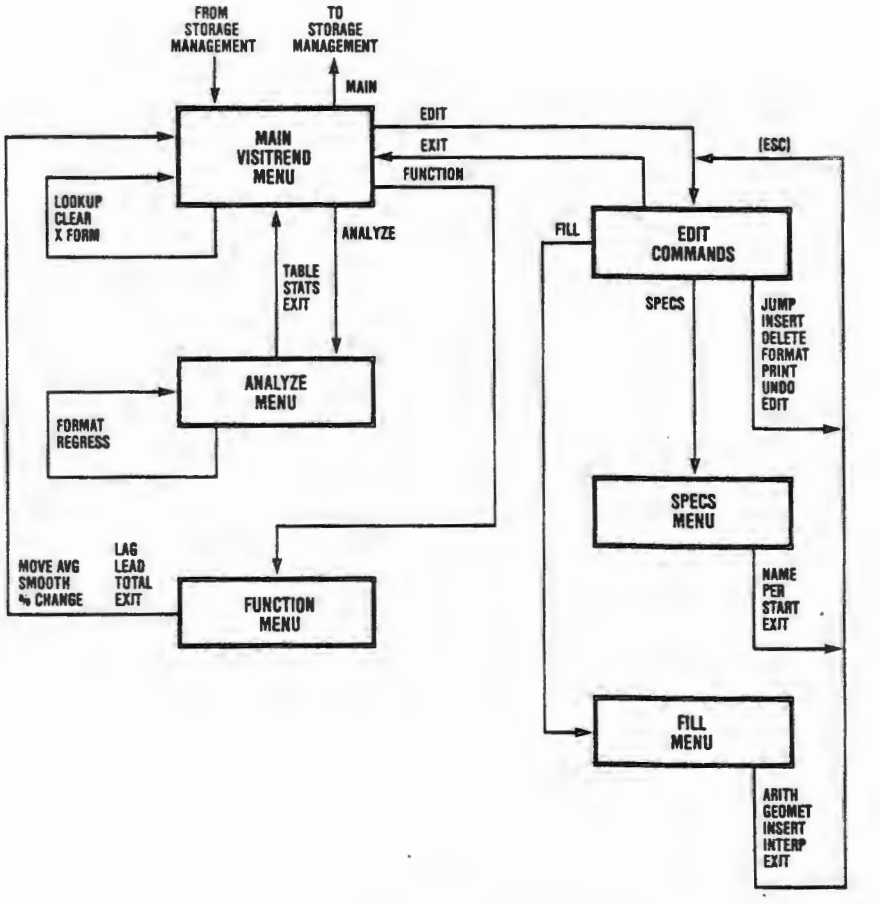
This section describes the VisiTrend/VisiPlot menu functions in alphabetical order. Along with the menu item descriptions, it lists the program in which the function is used and the menu in which it is found.

The menu flow charts show how to get to the various menus in each program.

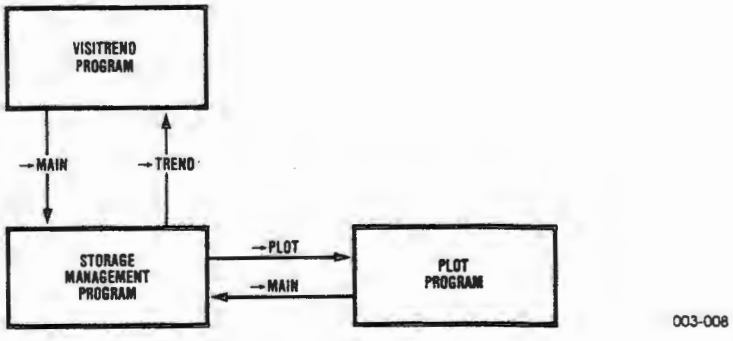
Flow between the programs is via —>PLOT or —>TREND in the Edit program and —>MAIN in the Plot and VisiTrend programs.



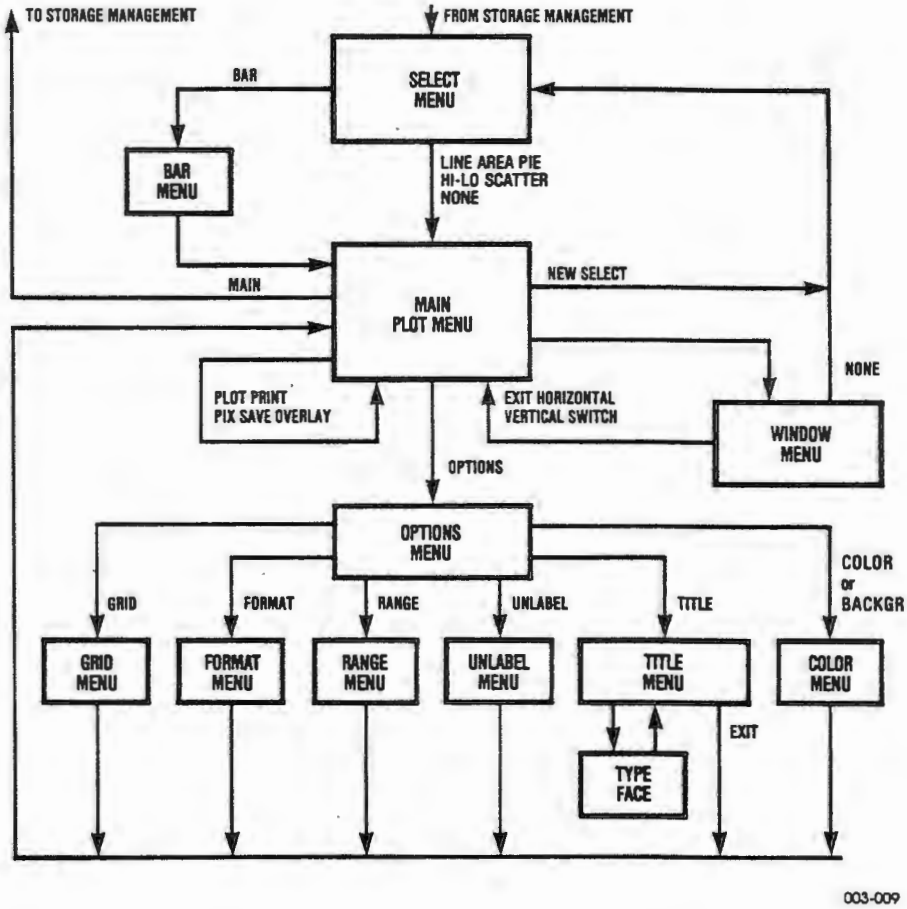
STORAGE MANAGEMENT FLOW



VISITREND PROGRAM FLOW



INTERPROGRAM FLOW



PLOT PROGRAM FLOW

ANALYZE (VisiTrend program—Main menu)

The ANALYZE function invokes the VisiTrend/VisiPlot Analysis functions. These functions list series contents, calculate and display series statistics, perform data regressions and trendline forecasting, and format data. For information on the specific functions see FORMAT, REGRESS, STATS, and TABLE.

ARITH (Storage Management program—Fill menu)
(VisiTrend program—Fill menu)

The ARITH function inserts new data into the current series beginning at the location of the cursor. The new data is an arithmetic progression. You are prompted for the number of points to be inserted and the factor by which the preceding point is to be increased or decreased. The new data points are inserted immediately following the data point currently indicated by the cursor.

AREA (Plot program—Select menu)

The AREA function specifies that an area chart is to be drawn. You must choose one or more series. When choosing multiple series, all series must have the same period. When multiple series are plotted, each series is drawn over the previous series. You should select the series with the largest values first, then the next largest, etc. If the series have mixed values, you will not get full detail for either series. In this situation, use the OVERLAY function to draw a line graph of one of the series. All area charts are plotted from the base line; they are not stacked.

BACKGR (Plot program—Options menu)

The BACKGR function sets the background color of the plot. BACKGR can only be used with LINE, BAR, and AREA charts; it cannot be used with PIE, HI-LO, and SCATTER charts. This function displays the color menu, offering a selection of eight colors. With black and white display monitors, only three backgrounds are available; all non-white and non-black colors produce the same grey halftone on the black-and-white screen.

The program displays the code for the color in the lower right corner of the status area. Two colors are listed; the first is the plotting color and second is the background color.

The BACKGR color is retained until it is explicitly changed with the BACKGR function or until it is reset with the NEW function.

When you change the background color, the VisiTrend/VisiPlot program changes the plotting color to avoid using the same color for background and plotting and to provide a clear, readable plot. You can change the plotting color after changing the background color, if you desire.

The following table lists the plotting colors the program uses for the various background colors. The following plotting colors apply if the background color was selected last. The series2 colors apply only when multiple series are selected. If a single series is selected and overlaid, the series1 color is used. The plotting colors for one and two current series

are listed. If more than two series are selected, the colors are repeated, that is, the third series is plotted in the same color as the first series.

NOTE: If you want three different colors for multiple series charts, you must select the first plotting color with the COLOR option. See COLOR for the colors used.

Table 3-3. Plotting Colors Generated by BACKGR

SELECTED BACKGROUND COLOR	LINE		AREA AND BAR*	
	FIRST COLOR (and 3rd)	SECOND COLOR (and 4th)	FIRST COLOR (and 3rd)	SECOND COLOR (and 4th)
Black1	White	White	White	Green
Green	Black	White	White	Black
Violet	Black	White	White	Black
White1	Black	Black	Black	Green
Black2	White	Orange	White	Blue
Orange	Black	White	White	Black
Blue	Black	White	White	Black
White2	Black	Blue	Black	Blue

* Stacked bar charts may be slightly offset from one series to the next due to the manner in which the Apple II handles color display.

BAR (Plot program—Select menu)

The BAR function specifies that a bar chart is to be drawn. You must choose one or more series. When choosing multiple series, all series are plotted, the bars for the various series are stacked on top of each other. That is, the first series is plotted on the base line and subsequent series are plotted from the top of the existing bars. The series are plotted in the order in which they are chosen.

When selecting a bar chart, you have the choice of full-width bars centered on the tick marks or half-width bars located to the left or right of the tick marks. The half-width bars are normally used to draw comparison charts. A comparison chart requires two selections—the first is PLOTed and the second is OVERLAYed. There may be very slight overlay between the left and right bars of a comparative chart. There may also be a slight offset at the divisions of stacked bar charts.

No zero line is drawn for bar charts with negative values. Negative values can be plotted but a zero line is not drawn on the screen.

Bar chart bars are displayed in one of three formats: solid, outlined, and shaded (outline plus horizontal stripes) bars.

BOTH (Plot program—Format, Grid, and Unlabel menu)

The BOTH function specifies that both of the subject items are to be used or deleted. In the Format menu BOTH means that plotting symbols and lines are used for line charts. In the Grid menu BOTH means that horizontal and vertical grid lines are drawn on the chart. In the Unlabel menu BOTH means that horizontal and vertical labels are drawn on the chart.

BOTTOMn (Plot program—Title menu)

The BOTTOMn functions specify the titles at the bottom of the chart. n is a digit—1, 2, or 3—specifying the first, second, or third bottom title line. The bottom titles are limited to 38 characters each. The titles are centered across the bottom of the chart. You must choose between bold and normal type face in the titles. The bottom titles cover the legend lines. BOTTOM1 is uppermost and BOTTOM3 is the lowest.

BOLD (Plot program—Title menu)

The BOLD function specifies that the subject title be displayed in bold characters. The alternative to bold titles is normal titles. All fixed titles except LEFT can be displayed in the bold typeface.

%CHANGE (VisiTrend program—Function menu)

The %CHANGE function calculates the percent change between successive points of a selected series and creates a new series containing the percent change data. The newly created file has the name of the source series with ".%" appended to it. For example, if you execute the %CHANGE function on the file EARNINGS, the generated data is put into the file EARNINGS.%. The new series has the same period as the source series and a start date one period later than the source series. If the source series has the range 1971 through 1980 and a period of 1, the percent change series has the range 1972 through 1980.

CLEAR (Storage Management program—Main menu)
(VisiTrend program—Main menu)
(Plot program—Options menu)

In the Storage Management and VisiTrend programs, the CLEAR function specifies that the selected series be erased from the computer memory. You are prompted to select all, none, or specific series to be erased. This function does not affect the files stored on diskette.

In the Plot program, the CLEAR function specifies that the range values you defined are to be disregarded and the range values stored with the series are to be used. This function has no effect if you did not define a range.

COLOR (Plot program—Options menu)

The COLOR function changes the plotting color used to draw a chart. This function displays the color menu, offering a selection of eight colors. With black-and-white monitors, only three colors are available; all non-white and non-black colors produce the same halftone on the black-and-white screen.

The program displays the code for the color in the lower right corner of the status area. Two colors are listed; the first is the plotting color and the second is the background color.

The plotting color is changed when the background color is changed. See BACKGR for a listing of the plotting colors generated when BACKGR is used. The following table lists the colors used for second and third selected series when the first plotting color is selected with the COLOR option. Note that only two plotting colors are available when BACKGR is used to allow the program to select the plotting colors and three plotting colors are available when you select the first plotting color with the COLOR option. COLOR must be used after BACKGR. Multiple plotting colors only apply to multiple selections plotted or overlaid at the same time. The sequence is not carried between plotting and overlaying, that is, when a series is overlaid, the color sequence starts over with the first color regardless of the number of series already plotted.

Table 3-4. Plotting Colors Generated by COLOR

SELECTED COLOR (and 4th color)	SECOND COLOR (and 5th color)	THIRD COLOR (and 6th color)
Black1	Green	Violet
Green	Violet	White
Violet	Green	White
White1	Violet	Green
Black2	Orange	Blue
Orange	Blue	White
Blue	Orange	White
White2	Blue	Orange

CONTINUE (Storage Management program—various menus)
(VisiTrend program—various menus)

The CONTINUE function is used in several functions that display data or the screen. If there is more data to be displayed, the CONTINUE function displays the next screenfull. When the last screen is displayed, CONTINUE exits the function and displays the next menu.

When used with the PRINT function, CONTINUE means return to the next menu without printing the screen contents.

DEFAULT (Plot program—Color menu)

The DEFAULT option returns the background and plotting color to the initial program selected colors, black1 and white1 (B1.W1). If you have not changed the colors, this option has no effect. When used with the BACKGR function, DEFAULT changes both the background and the plotting color. Used with COLOR, it changes only the plotting color to white1 (W1).

DELETE (Storage Management program—Edit commands menu)
(VisiTrend program—Edit commands menu)
(Storage Management program—Main menu extension)

In the Edit command menu, the DELETE function deletes selected data points from the current series. The deletion begins at the item indicated by the cursor when the function is invoked. Moving the cursor to the last item specifies the other end of the range to be deleted. The cursor can be moved up or down on the list. If you move the cursor beyond the end of the list, the DELETE function is canceled.

In the Main Storage Management menu extension, the DELETE function deletes selected files from the data diskette. You select the file to be erased from the listing of the file directory. Before the file is erased, you are asked to confirm that you want to permanently erase the file.

DIF (Storage Management program—Main menu)

The DIF function specifies that the series being saved is to be stored in a DIF file. Data in this format can be used with other Personal Software programs, such as the VisiCalc program. The alternative is the NORMAL format, which is only usable by the VisiTrend/VisiPlot program.

The DIF format is described in **Programmer's Guide to the Data Interchange Format**, document number SATN-18, which is available from the DIF Clearinghouse, P.O. Box 527, Cambridge, MA 02139.

DRIVE (Storage Management program—Main menu)

The DRIVE function changes the drive number assigned as the data diskette drive. The currently assigned drive number is displayed in the bottom line of the Main Storage Management status area. If drive 1 is currently assigned, the DRIVE function changes the assignment to drive 2 and vice versa. The DRIVE function, along with the SLOT function, specifies where the data diskette resides.

EDIT (Storage Management program—Main menu)
(VisiTrend program—Main menu)

The EDIT function invokes the Edit facilities. You are prompted to select a series from those currently in memory or to create a new series. When creating a new series, you are prompted for the name, period, starting date, and first data point. See the individual Edit commands.

EXIT (Plot program—various menus)
(VisiTrend program—various menus)
(Storage Management program—various menus)

The EXIT function leaves the current menu without performing a function. Usually, the EXIT function returns to preceding menu.

FILL (Storage Management program—Edit commands menu)
(VisiTrend program—Edit commands menu)

The FILL function generates data to be placed in the current series. The data can be an arithmetic series, a geometric series, or a series currently in memory. You are prompted for the number of values and a factor for the first two and a series name for the last. In all cases, the new data is inserted following the item currently indicated by the cursor. FILL also provides a linear interpolation function to approximate missing data points. See ARITH, GEOMET, INSERT, and INTERP.

FORMAT (Storage Management program—Edit command menu)
(VisiTrend program—Edit commands menu)
(VisiTrend program—Regress menu)

The FORMAT function specifies how the data is displayed on the screen. Unless otherwise specified data is displayed in the floating point format. In the fixed format, you can specify the number of decimal places (the precision) and the column width (the total number of digits). The precision can be 0 to 6 digits and the column width 6 to 16 digits. Numbers that are too large for the column size and numbers in the exponential format (1E-3 for example) when the fixed format is specified are displayed as a series of greater than symbols (>). You cannot enter values in the exponential format; the program converts numbers less than .001 and greater than 9 digits to the left of the decimal point to the exponential format.

FORMAT (Plot program—Options menu)

The Plot program FORMAT function specifies how a line, bar, or scatter chart is to be displayed. This function is not available for area, pie, and hi-lo charts. It displays a different menu for the different supported charts. When the function is chosen for an unsupported chart, the message CAN'T! NO OPTION HERE is displayed.

The line chart FORMAT menu allows the choice of plotting with both lines and symbols, lines only, or symbols only.

The bar chart FORMAT menu allows the choice of plotting with solid, shaded, or outlined bars.

The scatter chart FORMAT menu allows the choice of plotting with symbols or points.

The chart format is retained until changed by another FORMAT function, until a different type of chart is selected, or until reset by the NEW function.

FUNCTION (VisiTrend program—Main menu)

FUNCTION invokes the VisiTrend/VisiPlot predefined functions. FUNCTION calculates the moving average, does exponential smoothing, calculates the percent change, creates new series with a specified lead or lag from an existing series, and creates a new series with cumulative total of the source series. For further information on these functions see MOVE AVG, SMOOTH, %CHANGE, LAG, LEAD, and TOTAL.

GEOMET (Storage Management program—Edit commands menu)

(VisiTrend program—Edit commands menu)

The GEOMET function specifies that new data is to be inserted into the current series in a geometric progression. You are prompted for the number of data points to be generated and for the factor by which each preceding point is to be multiplied. The data points are inserted immediately following the data point currently indicated by the cursor.

GRID (Plot program—Options menu)

The GRID function draws grid lines on the currently displayed chart. The function is valid for all charts except pie charts. If offers the choice of vertical, horizontal, or both vertical and horizontal grid lines. You can erase grid lines by selecting them for a second time. For example, by selecting horizontal grid lines while horizontal grid lines are displayed erases the lines. You can erase horizontal, vertical or both. You cannot invoke this option until a chart is displayed.

HI-LO (Plot program—Select menu)

The HI-LO function specifies that a HI-LO chart is to be drawn. You must select two series. You are prompted to select the high series and the low series. You can select the series in either order, the program distinguishes between the high and low values. You cannot generate HI-LO charts with multiple sets of series, but you can overlay the charts. A HI-LO chart is displayed as a series of vertical lines connecting the high and low values. The vertical lines are not connected from time period to time period.

If you OVERLAY a HI-LO chart with a line chart, the line chart is plotted with points only. The points appear slightly to the right of the vertical lines. This feature makes it easy to generate stock charts showing high, low, and close. If you want to overlay a line chart with lines and/or symbols, you must select the format option.

HORIZ (Plot program—Grid, Unlabel, and Window menus)

The action of the HORIZ function depends on the menu from which it is invoked.

In the GRID menu it specifies that horizontal grid lines are to be drawn. If horizontal grid lines already exist, this function erases them.

In the UNLABEL menu it specifies that the horizontal range labels (X-axis) are to be erased.

In the WINDOW menu it specifies that the screen is to be divided into top and bottom windows as opposed to side by side windows.

INSERT (Storage Management program—Edit commands menu)

(VisiTrend program—Edit commands menu)

(Storage Management program—Edit Fill menu)

(VisiTrend program—Edit Fill menu)

In the Edit command menu, the INSERT function inserts a new data point anywhere within the selected series. The new point is inserted immediately preceding the data point at the current cursor location. The points that follow this point are pushed ahead to the next year and/or period. The last point in the series is given a new end date one period beyond the old end date.

In the Fill menu, the INSERT function inserts a selected series from memory into the currently displayed series. The new data immediately precedes the data point at the current cursor location. The new data is given the date of the current cursor location. The points that follow are pushed ahead and given new dates and/or periods as appropriate.

INTERP (Storage Management program—Edit Fill menu)

(VisiTrend program—Edit Fill menu)

The INTERP function performs a linear interpolation of the values beginning at the last non-zero value before the cursor location and continuing to the first non-zero value. This function assumes the cursor located on a zero value. The function replaces the zero values with the interpolated values between the two non-zero values. If the cursor is not located at a zero value, a beep sounds and the function is canceled.

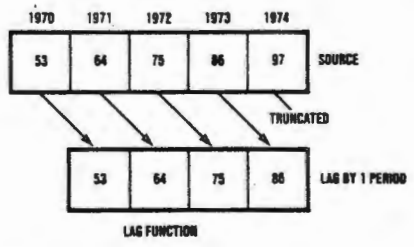
JUMP (Storage Management program—Edit commands menu)

(VisiTrend program—Edit commands menu)

The JUMP function moves the cursor to a specific date in the currently displayed series. You are prompted for the date. With the arrow keys you can move the cursor to the beginning or end of the series. The right arrow key specifies the end of the series and the left arrow key specifies the beginning.

LAG (VisiTrend program—Function menu)

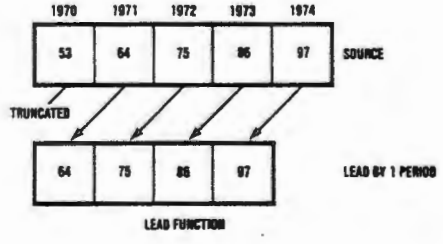
The LAG function creates a new series that lags the source series by a specified number of periods. The lagging series has the same values as the source series but they are shifted in time. In effect, lagging a series by one period, adds one to each date. All periods shifted beyond the ending date are lost to the new series. The LAG series name is the same as the source series with ".−n" appended to it. For example, a series that lags the series PE RATIO by 2 periods is given the name PE RATIO.−2. The figure shows the effect of the LAG function. You are prompted for the source series and for the number of periods that the new series is to lag by.



003-001

LEAD (VisiTrend program—Function menu)

The LEAD function creates a new series that leads the source series by a specified number of periods. The number of points that the new series is to lead the old are shifted out of the series. The lead series is shorter than the source series by the number of periods it is shifted. The LEAD series name is the same as the source series with ".+n" appended to it. n is the number of periods of lead specified. For example, a series that leads the series PE RATIO by 3 periods is given the name PE RATIO.3. The figure shows the effect of the LEAD function. You are prompted for the source series and for the number of periods the new series is to lead by.



003-002

LEFT (Plot program—Title menu)
(Plot program—Bar Chart menu)

In the Title menu, LEFT specifies that a title is to be placed to the left of the Y-axis. The left title is written vertically from top to bottom. It is centered to the left of the chart. The left title is limited to 18 characters. The UNLABEL function erases the left title. If you have created left and right windows, you can put a different LEFT title in each. In the window mode, a single LEFT title is drawn when top/bottom charts are displayed and separate LEFT titles are drawn when left/right charts are displayed.

In the Bar Chart menu, LEFT specifies that half-width bars are to be drawn and placed to the left of the tick marks. LEFT, along with RIGHT, is usually used for comparative bar charts.

LEGEND (Plot program—Title menu)

The LEGEND function redisplays the chart legend after it has been erased by a bottom title. If you OVERLAY a chart after entering the bottom titles, the LEGEND function displays the legend for the overlaid chart, not the original legend. This function erases all bottom title lines that covered legend lines. Any bottom title lines that didn't cover a legend line are not erased. With a pie chart, LEGEND erases the pie chart legend. Once the pie chart is erased, it cannot be redisplayed.

LINE (Plot program—Select menu)

The LINE function specifies that a line chart is to be drawn. You must choose one or more series. When selecting multiple series, all must have the same period. When multiple series are selected, the program draws each with a different symbol. The first uses the square box, the second uses a diamond, and the third uses the pound sign. If more than three series are selected, the three symbols are reused. The legend lists the names of the first three plotted series and the symbol used for each. Only the first three selected series are listed in the legend.

LINES (Plot program—Format menu)

The LINES function specifies that the line chart being drawn is to be drawn with interconnecting lines and without symbols. This function is only valid for the line chart.

LOAD (Storage Management program—Main menu)

The LOAD function loads a file from diskette. Files contain one or more series. You are prompted to select a file name from the directory of the current data diskette. The SLOT and DRIVE functions are used to change the disk drive used for the data diskette.

If the out-of-room-condition occurs, a partial load is performed if possible. As many series from the file as can be put into memory are loaded. The partial load only occurs with files stored in the normal VisiTrend/VisiPlot storage format. Partial loads are not done with files in the DIF format.

LOOKUP (Storage Management program—Main menu)
(VisiTrend program—Main menu)

The LOOKUP function lists the data series that are currently in memory. The display includes the series name, period, start date, end date, and number of data points in the series. Pressing any key returns to the Main Storage Management or VisiTrend menu. The program displays the LOOKUP list after each LOAD and CLEAR.

—>MAIN (Plot program—Main Plot menu)
(VisiTrend program—Main menu)

The —>MAIN function exits the Plot and VisiTrend programs and returns to the Storage Management program. You must verify that you want to change programs by responding to the prompt with Y. The series in memory are not lost during the transfer.

MAIN (Storage Management program—Main menu extension)

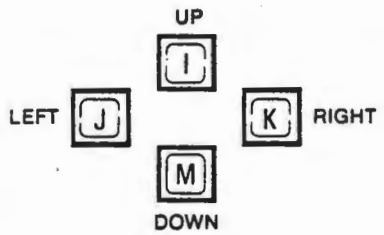
The MAIN function returns to the Main Storage Management menu from the menu extension without performing any of the extension functions.

MOVEABLE (Plot program—Title menu)

The MOVEABLE function places titles anywhere on the chart. A moveable title is limited to 32 characters.

This title is initially displayed at the left center of the chart. When first displayed, the title blinks; it continues to blink until it is fixed in place by pressing the RETURN key.

As the name implies, the title can be moved to any location on the screen. Movement is controlled by the I, J, K, and M keys and the space bar. The location of these keys indicates the direction they move the title:



001-004

The space bar stops the movement.

When you press a motion key, the title begins moving in the indicated direction until another motion key is pressed, the space bar is pressed, or the title runs into the outside limits of the chart. When the outside limit is reached, a beep is repeated until the motion is stopped or reversed. The number keys, 1 through 9, control the speed; 1 is the slowest speed and 9 is the fastest. You can change speed during movement. Pressing a speed key starts motion again, in the last direction. If you don't choose a speed, 2 is used.

You can delete the moveable title at any time by pressing the ESC key. Before a moveable title is fixed in place, its deletion does not affect what is under it. After it is fixed in place it can still be erased but anything under it is also erased.

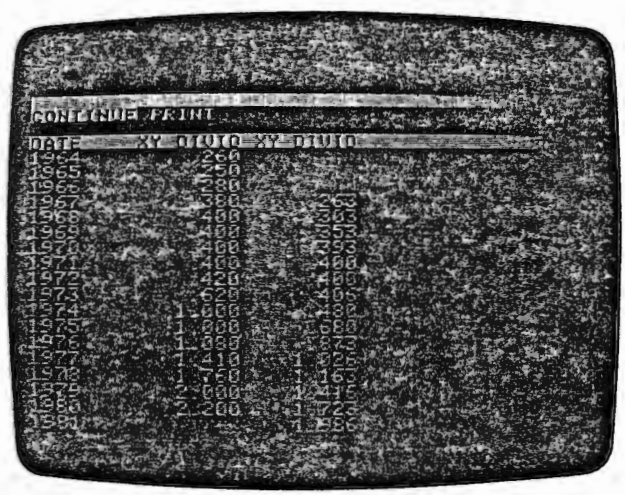
When the title is fixed, it is displayed in reverse video. Pressing the space bar changes it to normal video. Subsequent pressing of the space bar changes it back and forth. When you press RETURN the second time, the title is permanently fixed in either normal or reverse video. After the second RETURN, it can no longer be deleted. The second RETURN also returns you to the Title menu.

There is no limit to the number of moveable titles that can be put on a chart.

MOVE AVG (VisiTrend program—Function menu)

The MOVE AVG function calculates the moving average of a specified number of points within a selected series. The function prompts you to select the source series and to specify the number of periods over which the moving average is to be taken. The number of periods must be between 1 and the number of data points in the source series. The new series containing the moving average has the name of the source series with ".Mn" appended to it. n is the number of periods over which the average is calculated. For example, if you specify a moving average over three periods for the series DIVIDENDS, the new series is given the name DIVIDENDS.M3.

The figure shows a source series and a moving period over three periods.



NAME (Storage Management program—Edit Specs menu)

The NAME function changes the name of the series being edited.

NEW (Plot program—Main Plot menu)

The NEW function clears the screen and deletes the currently active series. It also deletes all options you have set. NEW resets the default plotting and background colors. It returns to single window operation if two windows are set. The NEW function also calls the Select menu.

NONE (Plot program—various menus)

The NONE function exits from a menu without making a selection. NONE usually returns to the menu that called the current menu.

NORMAL (Plot program—Title menu)
(Plot program—Bar menu)
(Storage Management program—Save menu)

In the Title menu, NORMAL specifies that the subject title is to be displayed in the normal, as opposed to bold, typeface.

In the Bar menu, NORMAL specifies that the chart be drawn with full-width bars centered on the tick marks.

In the Save menu, NORMAL specifies that a series is to be stored in the normal VisiPlot storage format, as opposed to the DIF format. In the normal format, the data can only be used with the VisiPlot program. The VisiPlot storage format is described in Appendix C.

OPTIONS (Plot program—Main Plot menu)

The OPTIONS function calls the Options menu, which provides the means of changing certain plotting and formatting values such as range, scale, color, background, and format. It also provides the facilities to add titles to a chart. For more information see TITLE, RANGE, FORMAT, GRID, UNLABEL, RESCALE, BACKGR, and COLOR.

OVERLAY (Plot program—Main Plot menu)

The OVERLAY function draws a chart on top of an existing chart, unlike the PLOT function which erases the existing chart before drawing a new one. OVERLAY does not compute range or scale values, it uses the existing values of the current chart. If the chart to be overlaid does not fit in the existing range and scale, an error message is issued.

No legend is displayed for the overlaid chart.

A chart must be displayed before OVERLAY can be used.

The chart being overlaid must have the same period as the existing chart. You cannot change the RANGE, SCALE, or BACKGR between a PLOT and an OVERLAY.

If you follow an OVERLAY function with a PLOT function, only the last selected series are drawn, that is, the series selected for the OVERLAY, not for the original PLOT or previous OVERLAY.

All types of charts except pie charts can be overlaid. Chart types—with the exception of pie charts—can be mixed with the OVERLAY function.

PER (Storage Management program—Edit Specs menu)
(VisiTrend program—Edit Specs menu)

The PER function changes the period of an existing chart. The function shows what the current period is and prompts for a new one. The valid periods are 1 through 99. If you don't enter a new period, the existing one is used. If you specify a new period, the currently displayed series is erased and redisplayed with the new period. The current beginning date is retained.

PIE (Plot program—Select menu)

The PIE function specifies that a pie chart is to be drawn. A pie chart consists of a circle that is divided into segments. The size of each segment is proportional to the ratio of the segment data value to the sum total of all the data values.

An individual pie chart compares the values of two to eight series at a specified date or reference number. It does not compare the different values in a single series. It is possible to do a pie chart for a single series but the resulting chart is a circle and the single series has a percentage of 100%.

In a pie chart the segments are drawn in a clockwise direction beginning at 3 o'clock. You are prompted for the date or reference number of the data. Each selected series must have a value for the specified date. If some series have very small relative values that result in small percentages, the legend letters around the chart may overlap. If this occurs, change the order in which the series are selected so that small segments are not side by side.

The pie chart is drawn with a letter outside the segments that corresponds to a line in the legend. The legend is in a box to the right of the chart that contains the series name and its relative percent of the total. The date or reference number of the data is displayed at the bottom of the legend. Because of rounding, the percentages listed in the legend may not add up to 100%.

The shading and titling prompts are displayed. You may title, shade, and title again. This sequence is fixed and once you have finished the second title phase, you cannot alter the pie chart. All the usual titling capabilities apply. You can erase the legend with the LEGEND function of the Title menu. This use of the LEGEND function applies only to pie charts.

PIXSAVE (Plot program—Main Plot menu)

The PIXSAVE function saves the screen image on a diskette file. The PIXSAVE file cannot be reloaded into the VisiPlot program. It can be used with user-supplied programs, such as screen dumps for graphic printers. You are prompted to put a data diskette in the data diskette drive. The PIXSAVE file does not show up on the VisiPlot directory; it will, however, show up on the DOS 3.3 listing of the diskette directory generated by the DOS 3.3 CATALOG command. Appendix A contains a listing of a simple program that prints a PIXSAVE file.

PLOT (Plot program—Main Plot menu)

The PLOT function specifies that the currently selected data series is to be plotted according to the current options. The PLOT function erases an existing chart. The error message PLEASE SELECT FIRST is displayed if no series is selected. After the chart is drawn, pressing any key returns the Main Plot menu to the screen.

—>PLOT (Storage Management program—Main menu)

The —>PLOT function specifies that the Plot program is to be loaded. You must verify that you want to change programs by pressing the Y key in response to the message TYPE Y TO CONFIRM. If you press any other key, the request to change programs is cancelled.

PRINT (Plot program—Main Plot menu)
(Storage Management program—various menus)
(VisiTrend program—various menus)

The PRINT function reproduces the screen image on the supported printer. The printer controller can be plugged into any slot (slot 1 is recommended). This function prompts for the slot number. CTRL-C interrupts the function and returns to the menu from which PRINT was issued. If the printer is not recognized in the specified slot, an unrecoverable error occurs and you must re-load the VisiTrend/VisiPlot program and begin again. This may occur because you specified the wrong number or because of an error in the printer interface card.

To print graphs on printers that are not supported by the VisiPlot program, see PIXSAVE.

QUIT (Storage Management program—Main menu)

The QUIT function returns you to Applesoft Basic. The Applesoft (]) prompt is displayed. You are asked to verify that you want to leave VisiTrend/VisiPlot by pressing the Y key. To return to VisiTrend/VisiPlot

you must enter the RUN INIT command. The VisiTrend/VisiPlot program is reloaded. Any series in memory are lost when you verify that you want to execute the QUIT function.

RANGE (Plot program—Options menu)

The RANGE function calls the Range menu. The Range menu displays the current series range. The Range menu lets you SET a new range or CLEAR a range you have previously SET. When SET is chosen, it prompts for new starting and ending dates. The chart is not redrawn until the PLOT function is executed. You also have the option to CLEAR a user-set range. CLEAR has no effect on the range if you have not changed it with the SET option. You also have the option of exiting the function.

See the description of range for a description of how the VisiTrend/VisiPlot program set ranges for different chart types.

REGRESS (VisiTrend program—Analyze menu)

The REGRESS function performs an ordinary least squares multiple regression. You are prompted to specify the dependent variable and from one to five independent variables from the list of series currently in memory. If you select more than five series for independent variables, an error message is issued. You are asked if you want to keep or change the current range for the selections. In a regression, the current range is the logical intersection of the ranges of the dependent and independent variables. The intersection of the ranges must have at least as many points as there are independent variables. Finally, you are prompted to choose whether the regression is to be computed with a constant term or through the origin (no constant).

The REGRESS function, optionally, generates a forecast series. This option is chosen by selecting the item (TREND) as the independent variable. You are asked to specify the number of periods to be forecast. The function develops a straight line series based on the dependent variable. It then extends the series the specified number of periods.

The regression computation typically takes 15 to 60 seconds. The results are displayed on the screen. These include the name of the dependent variable, the range, and the number of data points. For each independent variable, the series name, coefficient, standard error, and T-statistic are displayed. Below this information, the regression statistics are displayed, these are the R-squared, the corrected R-squared, the standard error of the regression, the sum of the squared residuals, the F-test value of the regression, and the Durbin-Watson statistic. When you perform a regression on one independent variable with no constant, the F-statistic and the corrected R-squared are meaningless and, therefore, are not computed.

After the results of the computations are displayed, you have the option of printing the display on a printer. If you do not print them, they are lost.

If there are at least two free series in memory and enough free data points in which to store the fitted values and residuals, you are prompted to choose to keep or discard these generated series. If you keep the values, they are saved under the name of the dependent variable with ".Fn" appended to the fitted series and ".Rn" appended to the residual series. n is a program generated number.

RESCALE (Plot program—Options menu)

The RESCALE function changes the Y-axis scale established by the program. The function prompts for a new minimum and a new maximum value. It also requests the number of divisions into which the Y-axis is to be divided (tick marks). For a scatter chart, it also prompts for maximum, minimum, and number of divisions for the X-axis.

If you specify a minimum that is greater than the maximum, the program reverses the values. If you specify the same value for the minimum and maximum, the program uses the specified value as the minimum and sets a maximum that is approximately 20 percent higher.

See the Scale section for a description of how the program sets scales for the charts.

RIGHT (Plot program—Bar menu)

The RIGHT function specifies that a bar chart is to be drawn with half-width bars located to the right of the tick marks. This function, along with the LEFT function, is used to draw comparative bar charts.

SAVE (Storage Management program—Main menu)

The SAVE function writes one or more series to a diskette file for permanent storage. You must choose whether the data is to be saved in the normal VisiTrend/VisiPlot format or the DIF format. After you select a format, the function displays a list of the series currently in memory and requests that you select those to be saved. It then displays a list of the files currently on the data diskette. You can choose to store the selected series in an existing file or create a new file. If you choose an existing file, all the data that is currently in that file is erased and replaced by the new series, not just those series with the same name. If you choose to store the series in a new file, you are prompted to name the file. If you do not specify a name, the SAVE request is cancelled.

SCATTER (Plot program—Select menu)

The SCATTER function specifies that a scatter chart is to be drawn. You are asked to select the series to be plotted along the X-axis and the Y-axis. The X-axis is scaled to the minimum and maximum for the X-axis series and the Y-axis is scaled correspondingly for the Y-axis series. The range of a scatter chart is the intersection of the two series and is not explicitly shown in the chart. You can change the range.

A scatter chart can be drawn with points or plotting symbols. If you don't make a choice with the FORMAT function, plotting symbols are used.

When you RESCALE a scatter chart, you are asked for new scale values for both the X- and Y-axis.

The X-axis scale factor, when required, is displayed below the X-axis.

SELECT (Plot program—Main Plot menu)

The SELECT function calls the Plot program Select menu from which you can select the type of chart to be drawn. The SELECT function does not eliminate the current active series until a new chart is selected and it does not change the current options in effect. You can keep the currently active series by choosing NONE and returning to the Main menu. To eliminate the current active series and the current options you have set, use the NEW function to call the Select menu.

The selected series name is displayed in the bottom line of the Main Plot status area. If you select multiple series, the name of the last one selected is displayed in the status area. When you select multiple series, the chart type in the Main Plot status area is followed by an ellipsis (...).

SET (Plot program—Range menu)

The SET function sets a new range for the series. You are prompted to enter new start and end dates for the new range. The range you set can be eliminated with the Range menu CLEAR function.

SLOT (Storage Management program—Main menu)

The SLOT function changes the currently assigned slot number for the data diskette drive. After the program is loaded, the slot from which the program was loaded is used as the data diskette slot number. When the SLOT function is selected, the slot number is changed to the next lower consecutive slot if it contains a disk drive controller. If there is no controller in the next lower slot number, the SLOT function is ignored.

If you have disk drive controllers in slots 5 and 6 the SLOT function switches between them. If you have controllers in slots 4, 5, and 6, the function switches from 6 to 5 to 4 to 6 and so on. If you have controllers in slots 4 and 6, the function is ignored. The SLOT function performs no function if there is disk drive controller card in a slot immediately adjacent to the boot slot.

The VisiTrend/VisiPlot program is always loaded from the controller plugged into the highest slot number.

SMOOTH (VisiTrend program—Function menu)

The SMOOTH function performs single exponential smoothing of the source series. You are prompted to select a series from those in memory. You must also select a weighting factor. The factor must be between 0 and 1. The smoothed series is saved under the name of the source series with ".S" appended to the name.

For each data point i in series Y and a smoothing factor of n, the function generates a corresponding point i in series X according to the algorithm:

$$Y_{(i)} = \alpha X_{(i-1)} + (1-\alpha)Y_{(i-1)}$$

SPECS (Storage Management program—Edit commands menu)
(VisiTrend program—Edit commands menu)

The SPECS function changes the specifications of the current series. The specifications that can be changed are the name of the series, the period, and the start date. For further information see NAME, PER, and START.

START (Storage Management program—Edit Specs menu)
(VisiTrend program—Edit Specs menu)

The START function changes the starting date of the current series. The series dates are changed immediately and shown in the display.

STATS (VisiTrend program—Analyze menu)

The STATS function computes descriptive statistics on one or more series. When two or more series are selected, this function also computes and displays the correlation coefficients of the selected series. If you do not explicitly set a data format, the statistics are displayed in floating point format and the correlation coefficients are displayed to three decimal places.

The function uses the following formulas.

For a series X1, X2,...Xn

The mean $\overline{X} = \frac{\Sigma Xi}{n}$

The population variance $\sigma^2 = \frac{ss}{n}$ where $ss = \Sigma (Xi-\overline{X})^2$

The population standard deviation $\sigma = \sqrt{\frac{ss}{n}}$

The STATS display is 40 columns wide. If more data than will fit in 40 columns is selected, some of the data is ignored.

The program prompts you to select one or more series. After selecting the series, you have a chance to keep the existing range or change it. If you don't change the range, the function uses the union of the ranges of all selected series. If you change the range, you are prompted for major and minor (if applicable) start and end dates. You have the option of printing the statistics.

SWITCH (Plot program—Window menu)

The SWITCH function switches from one window to the other when the program is in two-window mode. This function does not affect the chart displayed in the current window. The current window designation, which is in the lower right corner of the status area, is changed to show the window that is being used.

When you switch windows, the chart in the window you leave is frozen. You cannot return to the window and make changes to it; you must return to the window and start over with the selection process.

SYMBOLS (Plot program—Format menu)

The SYMBOLS function specifies that a chart is to be drawn with plotting symbols alone (no interconnecting lines). This function is used in the Format menu for line and scatter charts.

TABLE (VisiTrend program—Analyze menu)

The TABLE function produces a table of one or more series. You are prompted to select the series to be displayed. After selecting the series, you are given the option to keep the existing range or change it. If you don't change it, the program uses the union of the ranges of all selected series. If you choose to change the range, you are prompted for start and end dates.

The function display is a total of 40 character columns wide. If you select more series than will fit, those that will not fit are ignored. Because of the column width, longer series names are truncated.

The table is displayed 20 lines at a time. After each 20 lines, you are prompted to continue to the next 20 lines, print the current screen display and continue, or exit the function.

TITLE (Plot program—Options menu)

The TITLE function calls the Title menu, which contains the functions to add top, bottom, left, and moveable titles to the currently displayed chart. For more information see TOP, BOTTOMn, LEFT, LEGEND, and MOVEABLE.

TOP (Plot program—Title menu)

The TOP function centers a title over the displayed chart. The top title is limited to 38 characters. You are prompted to enter the title and then asked if it should be displayed in normal or bold typeface. You return to the Title menu for the TOP function.

TOTAL (VisiTrend program—Function menu)

The TOTAL function generates a new series that contains the cumulative total of the data points in the source series. The first data point in the TOTAL series is equal to the first point in the source series. The second point in the new series is equal to the first plus the second points in the source, and so forth.

TREND (Storage Management program—Main menu)

The TREND function specifies that the VisiTrend program is to be loaded. You must verify that you want to change programs by pressing the Y key in response to the message TYPE Y TO CONFIRM. If you press any other key, the request to change programs is cancelled.

UNDO (Storage Management program—Edit commands menu)

(VisiTrend program—Edit commands menu)

The UNDO function discards all changes made to a series during an editing session. This function restores the series to the condition it was in when it was selected for editing. When you UNDO a newly created series, it is deleted.

UNLABEL (Plot program—Options menu)

The UNLABEL function erases the X- and/or Y-axis labels. The function displays the Unlabel menu which offers the choice of erasing horizontal (X-axis) labels, vertical (Y-axis) labels, or both. You can also exit the function without erasing either. When the vertical labels are erased, a left title is also erased if it is present. If no chart is displayed, this function immediately returns to the Main menu.

VERT (Plot program—Grid, Unlabel, and Window menus)

The VERT function specifies that the currently selected function is to be performed in a vertical manner.

In the Grid menu, VERT draws vertical grid lines on the current chart.

In the Unlabel menu, VERT erases the current vertical labels.

In the Window menu, VERT divides the screen into side by side windows.

WINDOW (Plot program—Main Plot menu)

The WINDOW function divides the screen into two windows, switches between the windows, and changes back to a single, full screen window format. This function divides the screen into a horizontal configuration with top and bottom windows or a vertical configuration with side by side windows.

The chart legends are not displayed in the window mode.

The window mode is displayed in the extreme lower right corner of the status area. If the area is blank, the screen is not divided into two windows. When the screen is divided, the codes WT, WB, WL, or WR are displayed, indicating that the current window is the top, bottom, left or right window.

The two-window mode is cancelled by selecting NONE from the Window menu. It is also cancelled by the NEW function from the Main manu and when a PIE chart is selected.

XFORM (VisiTrend program—Main menu)

The XFORM function transforms any existing series or groups of series through mathematical operations to create a new series.

You are prompted to enter a name for the series to receive the transformed values. If you press RETURN without entering a series name, the program generates a name in the form SERIESn, where n is a digit.

After naming the new series, you are prompted to enter the transform expression. The list of series in memory is displayed with this prompt.

To enter the transform, type it at the keyboard. However, do not type name of the series. To enter a series name into the transform, press the right arrow key. The cursor appears in the series listing. The indicated name appears in the transform. Pressing the arrow keys moves the cursor up and down the listing in the normal manner. As the cursor moves, the currently indicated series name replaces the previous name in the transform. To select a series, press RETURN or enter the next character in the transform expression.

When the formula or expression is complete press RETURN to perform the transformation and create the new series. If the last item in the transform is a series name, you must press RETURN twice, once to select the series and once to fix the transform.

You can erase what you have entered by pressing ESC. ESC erases series names as well as characters entered from the keyboard. A series name is erased as a whole, not a character at a time. When ESC is first pressed, all series names are bracketed with back slashes (/) so they are more easily identified.

There are several ways you can make an error in creating a transform. You can enter an invalid expression, such as one with unbalanced parentheses, or you can specify an invalid operation such as division with zero. When an error is encountered, TRANSFORM ERR is displayed followed by a message or number. When a message is displayed, pressing RETURN displays more information in some conditions. The number is an Applesoft Basic error message number. See the **Applesoft Basic Programming Reference Manual** for a full description of the error condition.

If you get the message BAD EXPRESSION, you either mismatched parentheses (or similar syntactical mistake) or typed a series name instead of using the arrow keys to select it.

In creating transforms you can use the following mathematical operators:

Arithmetic operators:

+ — Addition
− — Subtraction
* — Multiplication
/ — Division
^ — Exponentiation

Logical operators:

AND
OR
NOT

Comparative operators:

< — Less than
<= — Less than or equal
= — Equal
> — Greater than
> — Greater than
>= — Greater than or equal

Functions:

SGN — Sign
INT — Integer part of
SQR — Square root
LOG — Natural logarithm
EXP — e to the power of
RND — Random number between 0 and 1
ABS — Absolute value of

Trig functions:

SIN — Sine
COS — Cosine
TAN — Tangent
ATN — Arctangent

The functions are applied exactly as in Applesoft Basic. In place of the Basic variables, you substitute the name of a VisiTrend/VisiPlot series.

ERROR MESSAGES

The following are the error messages issued by the VisiTrend/VisiPlot program. The messages are in alphabetical order by the first word of the message. The error descriptions include suggestions on further action whenever possible. If an error message with a number appears, see **The DOS Manual**, Apple product number #A2L0036.

(beep)

A beep is sounded whenever inappropriate data is entered or an illegal operation is attempted. When inappropriate data is entered, no message is displayed, only the beep is sounded. When you encounter this, try your entry again. You probably pressed the wrong key by mistake, such as pressing a letter key when the program was looking for numeric data.

CAN'T! BAD PERIODICITIES

You selected series that have different periods. All series used in a chart, whether a multiple series chart or an overlay of two or more charts, must have the same period.

Several conditions can cause this message to be issued:

- There is no data in the range you specified with the RANGE function.
- There are more than 150 points in the range. For example, you tried to plot two series and the combined ranges of the two series exceeds 150 points.
- You attempted to draw a scatter chart with two series that have no common values at any date.
- You attempted to draw a pie chart with one or more series that have no data at the date specified for the pie chart.

CAN'T! DIVISION BY ZERO

You specified a division by zero in an XFORM operation. Reenter the formula after correcting the division by zero error.

CAN'T! ERROR: DISK I/O or DISK ERROR

This error can be caused by disk problems such as having the drive door open, no diskette in the drive, and a full diskette.

CAN'T! ERROR: WRITE PROTECTED

You attempted to save some series in a file on a write-protected diskette. Either replace the data diskette with one that is nor write-protected or remove the write disable tab from the diskette. You should determine why the diskette was write-protected before removing the write disable tab.

CAN'T! NO OPTION HERE

Certain options are not applicable in all instances. When you see this error message, you tried to apply a function that is not legal in the current circumstances. Usually, an option can be applied wherever it is meaningful and useful. Some of the invalid uses of options are:

- Specifying GRID when no chart is displayed on the screen.
- Specifying the FORMAT option after selecting the COLOR or BACKGR options. (Plotting symbols do not appear properly in color or against colored backgrounds.)
- Specifying BACKGR or COLOR for a pie, scatter, or hi-lo chart. Pressing any key except RESET returns to the main menu.

CAN'T! NO OVERLAY HERE

You attempted to use the OVERLAY function when there was no chart displayed. Or you specified COLOR or BACKGR and then immediately tried to overlay. You can select COLOR or BACKGR, then PLOT, and then OVERLAY another series.

CAN'T! PLEASE SELECT FIRST

You attempted to select the OPTIONS functions without first selecting a series. Select a series and then return to the OPTIONS function.

CAN'T! PRESS ANY KEY

You are drawing a bar chart that has an off-scale data point. This message occurs when the first off-scale bar is encountered. The VisiTrend/VisiPlot program does not draw bar charts with off-scale data. This error also occurs if you press CTRL-C or RESET while drawing a graph.

CAN'T TRANSFORM! BAD EXPRESSION

You entered an XFORM expression that contains an illegal operator, unbalanced parentheses, or you typed a series name instead of selecting it with the cursor and RETURN.

DATA OFF SCALE: Y TO DISPLAY

You rescaled the chart and in the new scale, some data points fall outside the specified scale. Pressing Y causes a partial plot to be drawn. Each time an off-scale value is encountered, the beep sounds. Pressing any other key aborts the drawing of the chart. If the chart is a bar chart, the plot is aborted when the first off-scale data point is encountered.

DISKETTE ALREADY INITIALIZED

You selected the INIT function and the diskette in the data diskette drive is initialized. If you continue, the data on the diskette will be erased. Press the ESC key to cancel, any other key continues the function.

NO ACTIVE SERIES

You attempted to invoke a function that cannot be invoked until a series is selected through the Select menu. You may have switched windows and forgotten to select a series for the new window. You must select a series after switching windows, even if you want to plot the same series.

NO MORE ROOM!

You tried to LOAD a file when there was not enough room in memory to hold all the series in the file. You must CLEAR enough series out of memory to make room for the series in the file.

It is possible to get this error message if a non-VisiTrend/VisiPlot file, that because of its format is mistaken for a VisiTrend/VisiPlot file, is loaded.

PUT IN PROGRAM DISKETTE, PRESS ANY KEY

You tried to change programs when the VisiTrend/VisiPlot program diskette was not in the boot slot. Insert the VisiTrend/VisiPlot program diskette and press any key except RESET to continue.

PLEASE SELECT FIRST

You selected the PLOT or OPTIONS function when there was no current series to be plotted. You may have switched windows; you must use the SELECT function to select a series after switching windows, even if you want to plot the same series.

SINGULAR MATRIX

You selected independent variables for a multiple regression that either exhibit a high degree of collinearity or have very different scales.

When the independent variables are highly correlated, it is mathematically impossible to perform a regression. If two variables are simple multiples of each other, they are perfectly correlated. You should be careful in creating regression variables using the XFORM function.

If any pair of independent variables have very different scales (one in the range around .01 and the other in the range around 1,000,000, for example) a regression cannot be performed. Use the XFORM function to multiply or divide one series by a power of 10 to eliminate the

different scale problem. You must adjust the coefficient of the scaled variable. For example, if you divided a variable by 100 to run the regression, multiply the resulting coefficient of that variable by 100 to obtain the correct value. This technique affects the fitted and residual values, however, the descriptive statistics of the regression will be correct as shown.

UNABLE TO LOAD: WRONG FORMAT

You attempted to load a data file that is not in the VisiTrend/VisiPlot data format or the DIF format. Only files in these formats can be loaded by the VisiTrend/VisiPlot program.

WON'T! THIS IS THE PROGRAM DISKETTE

You selected the INIT function and the drive that the program found in the data diskette drive is the VisiTrend/VisiPlot program diskette. Initializing a diskette destroys everything on it. You cannot continue because you would destroy your program diskette.

APPENDIX A

SAMPLE PRINT PIXSAVE PROGRAM

The following program prints a chart that was saved on diskette in binary format with the PIXSAVE function in the Plot program. This program assumes:

- The VisiTrend/VisiPlot program diskette is in Drive 1 and contains the printer drive program under the name VISIPLOT.DRIVER.
- The data diskette is in Drive 2 and contains the PIXSAVE file that is to be printed. The sample program uses the name PLOT.PIX; change this to the name of your file.
- The printer interface card is plugged into Slot 1. The slot number is defined in the SLOT = 1 statement. If your printer is plugged into slot 5, you would enter the statement as SLOT = 5.

To create a program and save it on the program or any other diskette, enter the following:

```
NEW
  1 REM DEFERRED MODE EXAMPLE
 10 D$ = CHR$ (4)
 20 SLOT = 1
 30 PRINT D$;"BLOAD VISIPLOT.DRIVER,D1,A$98C3"
 40 HGR
 50 PRINT D$;"BLOAD PLOT.PIX,D2,A$2000"
 60 POKE 39118,SLOT
 70 PRINT D$;"PR#";SLOT
 80 CALL 39125
 90 TEXT
100 PRINT D$;"PR#0"
110 END
SAVE <name>
```

See **The DOS Manual** for details on saving a program on diskette and the Applesoft Basic Reference manual for details on entering a program in deferred mode.

You can also enter a series of commands in immediate mode and have them executed as you enter them. This series of commands must be entered each time you want to print a chart.

```
D$ = CHR$(4)
SLOT = 1
BLOAD VISIPLOT.DRIVER,D1,A$98C3
HGR
BLOAD PLOT.PIX,D2,A$2000
POKE 39118,SLOT
PRINT D$,"PR#";SLOT
CALL 39125
PRINT D$;"PR#0"
TEXT
```

NOTE: When you enter statements in immediate mode, the statements may not appear on the screen after typing HGR. This is a normal condition, not an error. TEXT restores the screen to normal (non-graphics) mode.

See the Applesoft Basic Programming Reference manual for details about entering commands in immediate mode.

APPENDIX B

SUPPORTED GRAPHIC PRINTERS

The program supports the following graphic printers:

- Apple Silentype
- Centronics 739
- Epson MX-80 (with GRAFTRAX 80™ option installed) and MX-100
- IDS Paper Tiger 440G and 445G
- IDS Paper Tiger 460G and 560G (with Dot Plot™ option installed)
- NEC Spinwriter 5510, 5520, and 5530
- Qume Sprint 5/45
- Trendcom 200G

NOTE: This appendix does not tell you how to install and operate your printer, see your computer and printer documentation or your local dealer for that information. This appendix only tells you which switches to set so you can print the graphic output from the program.

Any printer and model not specifically mentioned is not supported.

The program operates correctly in serial mode with the Apple Serial Interface card or the Apple Communications Interface card. Operation with any other serial or communications interface card may produce incorrect results or cause the program to hang.

To support these printers, the program diskette contains several printer driver programs. The drivers are for the combinations of different printers and the Apple Serial, Communications, and Parallel Interface cards. The serial drivers operate with the Apple Serial Interface card and the Apple Communications Interface card. The parallel driver programs operate only with the Apple II Parallel Interface card, with the exception of the Epson MX-80 and MX-100 printers which operate only with the Epson MX Apple II interface card.

CHOOSING THE CORRECT DRIVER

The program uses only one printer driver which must be named VISIPLOT.DRIVER. To use a different printer you must RENAME one of the supplied drivers on the program diskette to VISIPLOT.DRIVER.

The program comes with the driver for the Apple Silentype stored as VISIPLOT.DRIVER. If you use a different printer, first rename VISIPLOT.DRIVER to SILENTYPE.D and then rename the driver for your printer to VISIPLOT.DRIVER. For example, if you want to use the Epson driver EPSON-MX-80/100-P.D, you must enter the following RENAME commands:

```
RENAME VISIPLOT.DRIVER,SILENTYPE.D
RENAME EPSON-MX-80/100-P.D,VISIPLOT.DRIVER
```

It is advisable to write down the name of the driver that you rename or create a dummy reference file with that name. Use the same names if you change drivers again. Creating new names could cause you problems if you change drivers often.

To change the names you must use the Apple II DOS 3.3 RENAME command. Be sure to remove the write disable tab before attempting to RENAME a driver file. Also be sure to replace the write tab after changing the names.

When using the printer drivers, it is your responsibility to position the paper in the printer before you request the printing of listings or charts. No automatic form feeds, top of form, and so forth are provided.

Table B-1 lists the driver names for the various configurations of the supported printers. Double width graphics, triple width graphics, and auto-linefeeds are software functions, not hardware options. You need no extra equipment to use them. Auto-linefeed means that the printer driver automatically supplies a linefeed after each carriage return. If your printing comes out double spaced and you are using an auto-linefeed driver, use the corresponding non-auto-linefeed driver. If your printing comes out all on the same line and you are not using an auto-linefeed driver, use the corresponding auto-linefeed driver. The Epson MX-80 and MX-100 support normal and high density graphics. In high density mode, the printer prints twice as many dots per inch as it does in normal density.

Not all of the printer driver programs listed in Table B-1 are shipped with the program diskette. Those that are not on your program diskette are available from your dealer.

Table B-1. Drivers for the Supported Printers

PRINTER	DRIVER NAME	DESCRIPTION
Apple Silentype	SILENTYPE.D	Apple Silentype Printer/Interface
	SILENTYPE-DW.D	Apple Silentype w/double width graphics
Centronics 739	CENT-739-P.D	Apple Parallel Interface
	CENT-739-P-LF.D	Apple Parallel Interface w/auto-linefeed
	CENT-739-P-DW.D	Apple Parallel Interface w/double width graphics
	CENT-739-P-LF-DW.D	Apple Parallel Interface w/auto-linefeed and double width graphics
EPSON MX-80	EPSON-MX-80/100-P.D	Printer with Epson Parallel Interface card
	EPSON-MX-80/100-P-LF.D	Printer with Epson Parallel Interface card w/auto-linefeed
	EPSON-MX-80/100-P-HD.D	Printer with Epson Parallel Interface card w/high density graphics
	EPSON-MX-80/100-P-LF-HD.D	Printer with Epson Parallel Intercard w/high density graphics and auto-linefeed
	EPSON-MX-80-P-DW.D	Printer with Epson Parallel Interface card w/double width graphics
	EPSON-MX-80-P-LF-DW.D	Printer with Epson Parallel Interface card w/auto-linefeed and double width graphics
	EPSON-MX-80-P-DW-HD.D	Printer with Epson Parallel Interface card w/double width graphics and high density graphics
	EPSON-MX-80-P-LF-DW-HD.D	Printer with Epson Parallel Interface card w/auto-linefeed, double width graphics, and high density graphics

PRINTER	DRIVER NAME	DESCRIPTION
EPSON MX-100	EPSON-MX-80/100-P.D	Printer with Epson Parallel Interface card
	EPSON-MX-80/100-P-LF.D	Printer with Epson Parallel Interface card w/auto-linefeed
	EPSON-MX-80/100-P-HD.D	Printer with Epson Parallel Interface card w/high density graphics
	EPSON-MX-80/100-P-LF-HD.D	Printer with Epson Parallel Interface card w/high density graphics and auto-linefeed
	EPSON-MX-100-P-DW.D	Printer with Epson Parallel Interface card w/double width graphics
	EPSON-MX-100-P-LF-DW.D	Printer with Epson Parallel Interface card w/auto-linefeed and double width graphics
	EPSON-MX-100-P-DW-HD.D	Printer with Epson Parallel Interface card w/double width graphics and high density graphics
	EPSON-MX-100-P-LF-DW-HD.D	Printer with Epson Parallel Interface card w/auto-linefeed, double width graphics, and high density graphics
IDS Paper Tiger 440G and 445G	IDS-44X-S.D	IDS 440G/445G w/Apple Serial Interface or Apple Communications Interface
	IDS-44X-S-LF.D	IDS 440G/445G w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed
	IDS-44X-P.D	IDS 440G/445G w/Apple Parallel Interface
	IDS-44X-P-LF.D	IDS 440G/445G w/Apple Parallel Interface w/auto-linefeed
IDS Paper Tiger 460G and 560G	IDS-4/560-S.D	IDS 460G/560G w/Apple Serial Interface or Apple Communications Interface
	IDS-4/560-S-LF.D	IDS 460G/560G w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed

PRINTER	DRIVER NAME	DESCRIPTION
	IDS-4/560-S-DW.D	IDS 460G/560G w/Apple Serial Interface or Apple Communications Interface w/double width graphics
	IDS-4/560-S-LF-DW.D	IDS 460G/560G w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed and double width graphics
	IDS-560-S-TW.D	IDS 560G only w/Apple Serial Interface or Apple Communications Interface w/triple width graphics
	IDS-560-S-LF-TW.D	IDS 560G only w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed and triple width graphics
	IDS-4/560-P.D	IDS 460G/560G w/Apple Parallel Interface
	IDS-4/560-P-LF.D	IDS 460G/560G w/Apple Parallel Interface w/auto-linefeed
	IDS-4/560-P-DW.D	IDS 460G/560G w/Apple Parallel Interface w/double width graphics
	IDS-4/560-P-LF-DW.D	IDS 460G/560G w/Apple Parallel Interface w/auto-linefeed and double width graphics
	IDS-560-P-TW.D	IDS 560G only w/Apple Parallel Interface w/triple width graphics
	IDS-560-P-LF-TW.D	IDS 560G only w/Apple Parallel Interface w/auto-linefeed and triple width graphics
NEC Spinwriter 5510 and 5520	NEC-SPINW-S.D	NEC Spinwriter w/Apple Serial Interface or Apple Communications Interface
	NEC-SPINW-S-LF.D	NEC Spinwriter w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed
NEC Spinwriter 5530	NEC-SPINW-P.D	NEC Spinwriter w/Apple Parallel Interface
	NEC-SPINW-P-LF.D	NEC Spinwriter w/Apple Parallel Interface w/auto-linefeed

PRINTER	DRIVER NAME	DESCRIPTION
Qume Sprint 5/45	QUME-S5-S.D	Qume Sprint w/Apple Serial Interface or Apple Communications Interface
	QUME-S5-S-LF.D	Qume Sprint w/Apple Serial Interface or Apple Communications Interface w/auto-linefeed
Trendcom 200G	TRENDCOM.D	Trendcom 200G printer/interface
	TRENDCOM-DW.D	Trendcom 200G w/double width graphics

PRINTER SUPPORT FOR NON-GRAPHICS PRINTERS

If you have a printer other than the supported graphic printers, you can print listings but not charts. Textual printing is supported for specific interfaces as opposed to specific interface/printer pairs. There are four printer drivers for the Apple parallel interface and serial or communications interfaces with and without auto-linefeed. The drivers are listed in Table B-2.

Table B-2. Drivers for the Text-only Interfaces

INTERFACE	DRIVER NAME	DESCRIPTION
Parallel	TEXT-P.D	Apple Parallel w/o auto-linefeed
	TEXT-P-LF.D	Apple Parallel w/auto-linefeed
Serial	TEXT-S.D	Apple Serial or Communications w/o auto-linefeed
	TEXT-S-LF.D	Apple Serial or Communications w/auto-linefeed

PRINTER SET UP AND SWITCH SETTINGS

The following sections describe the preparation of the individual supported printers and interface cards for use with the program. These sections are intended only as an aid in preparing the printers and interface cards for use with this program. They are not exhaustive directions on setting up the printers. For that information, see the documentation that the manufacturer ships with the printer and/or interface card or contact your local dealer.

You must turn your printer off before setting the switches.

Only those switch settings that are necessary to print graphics are listed. Because the other switches may depend upon your configuration or are meaningless in this application, no switch position is suggested.

Note that there may be as many as three different sets of switches involved with a specific printer/interface card set up. The printer may have internal and/or external switches, and there may be switches on the interface card in your computer. Make sure you are setting the correct switches.

APPLE SILENTYPE

No set-up is required. Use the printer driver that matches your configuration.

CENTRONICS 739

The Centronics 739 only operates with the Apple Parallel Interface card. There are no switches on the interface card. There are only two switches on the printer and their settings are shown in Table B-3.

Table B-3. External Switch Settings for the the Centronics 739 Printer

SWITCH	SETTING
On-line/Off-line	On-line
Power	On

EPSON MX-80

The Epson MX-80 operates only with the Epson parallel interface card.

The printer contains internal DIP switches which must be set correctly set for it to print graphics. The DIP switches are located near the back of the main circuit board. See your *MX-80 User's Manual* and the GRAFTRAX-80 supplement for complete details. Table B-4 lists the switch settings that must be checked and set if necessary. Switches that are not listed can be set as your system or configuration requires. The Epson parallel interface card has no switches. The printer must be on-line. There are no other external switches to set.

Table B-4. Epson MX-80 Printer Internal DIP Switch Settings

DIP	SWITCH	SETTING
DIPS1	2	On (CR = print)
	3	On (Buffer full = print)

EPSON MX-100

The Epson MX-100 operates only with the Epson parallel interface card.

The printer must be on-line, otherwise there are no internal or external switches to set.

IDS PAPER TIGER 440G, 445G, 460G, and 560G

The IDS Paper Tiger printers operate with either a serial or parallel interface. You must have the Dot Plot graphics option to print charts. The Dot Plot graphics option is denoted by a G in the model number, i.e., 460G. Without the Dot Plot graphic option, you can print only listings, not charts.

Under some circumstances, the IDS printers may begin to print continuously when the power is turned on. To avoid this you must load the System Master diskette and enter the commands:

PR# (printer slot number) usually PR#1
PR#0

before turning on the printer. Turn on the printer, insert the program diskette, and issue the command RUN INIT.

Serial Operation

The Baud rate limit is 1200 with the Apple Serial Interface card.

With an unmodified Apple Communications Interface card, the Baud rate is 300. During printing, the data may also appear on the screen. When printing is completed, the screen image returns to normal.

Table B-5 lists the DIP switch settings that should be used with the models 440G and 445G. Table B-6 lists the switch settings for the models 460G and 560G.

Table B-5. Paper Tiger Model 440G and 445G Printer Internal Switch Settings Used with Apple Serial Interface Card

DIP	SWITCH	OPTION	SWITCH SETTING
DIPS3	SW6	Graphics Print Capability Enable	On (Switch is meaningless for printers without the graphics option)
DIPS4	SW5	Auto-Linefeed	User Choice (Select driver to match setting)
	SW6	Remote Printer Control Deselect	Off

Table B-6. Paper Tiger Model 460G and 560G Printer Internal Switch Settings Used with Apple Serial Interface Card

DIP	SWITCH	OPTION	SWITCH SETTING
DIPS4	SW4	Automatic Boundary	User Choice (CAUTION: If On, make sure there are enough lines on the current page for the graph before printing, otherwise the 1-inch skip will occur within the chart.)
	SW5	Auto-Linefeed	User Choice (Select driver to match.)
	SW7	Expanded Function	Must be On

The switches on the Apple Serial Interface card should be set as shown in Table B-7.

Table B-7. Apple Serial Interface Card Switch Settings for All Paper Tiger Printers

SWITCH	OPTION	SWITCH SETTING
5,6	Paper Size	User Choice (If set to On/On, printing occurs simultaneously on the screen and printer

Parallel Operation

To use the Apple Parallel Interface card use the printer DIP switch settings shown in Table B-8 for the models 440G and 445G and in Table B-9 for the models 460G and 560G. There are no switches to be set on the Apple Parallel Interface card.

Table B-8. Paper Tiger Model 440G and 445G Printer Internal Switch Settings Used With an Apple Parallel Interface Card

DIP	SWITCH	OPTION	SWITCH SETTING
DIPS3	SW6	Graphics Print Capability Enable	On (Switch is meaningless for printers without the graphics option)
DIPS4	SW5	Auto-Linefeed	User Choice (Select driver to match setting)
	SW6	Remote Printer Control Deselect	Off

Table B-9. Paper Tiger Model 460G and 560G Printer Internal Switch Settings Used with Apple Parallel Interface Card

DIP	SWITCH	OPTION	SWITCH SETTING
DIPS4	SW4	Automatic Boundary	User Choice (CAUTION: If On, make sure there are enough lines on the current page for the graph before printing, otherwise the 1-inch skip will occur within the chart.)
	3W5	Auto-Linefeed	User Choice (Select driver to match.)
	SW7	Expanded Function	Must be On

NEC SPINWRITER 5510 and 5520

The program supports the serial interface NEC Spinwriters with the NEC-compatible graphics option. The models 5510 and 5520 operate with the Apple Serial Interface card or the Apple Communications card.

If your Apple Serial Interface card has the P8 PROM, the serial operation speed cannot exceed 300 Baud. If the P8A PROM is installed, the speed cannot exceed 1200 Baud.

For operation with the Apple Communications Interface card, the Baud rate is 300 for an unmodified card. During printing, the data may also appear on the screen. When printing is completed, the screen image returns to normal.

The Spinwriter may beep and not start printing when you first attempt to print after the Apple II is powered-on. To clear this, press the RETURN key on the Apple keyboard.

The switches on your Spinwriter should be set as shown in Table B-10.

Table B-10. NEC Spinwriter Printer External Switch Settings (Models 5510 and 5520)

SWITCH	SETTING
Local LF	User choice (select driver to match setting)
LF	6
SP	10
Remote/Local	Remote (if switch is present)

The switches on the serial interface card should be set as shown in Table B-11.

Table B-11. Serial Interface Card Settings

SWITCH	OPTION	SWITCH SETTING
5,6	Paper Size	User Choice (Must not be set to On/On)

NEC SPINWRITER 5530

The program supports the parallel interface NEC Spinwriters. The model 5530 operates only with the Apple Parallel Interface card which has no switch settings.

To prepare the model 5530, you must check, and if necessary set, DIP switches located on the circuit boards inside the printer. If you need help taking the printer apart contact the NEC Information Systems Regional Office or your local field service representative. See the NEC documentation for the address and phone number.

The DIP switches and their use are described in Appendix A of the *Spinwriter Model 5530 Product Description* which comes with the printer. Table B-12 lists the necessary switch settings for the G9BNA board (furthest back) and Table B-13 lists the settings for the G9BNB board (next to the G9BNA board).

Table B-12. NEC Spinwriter Model 5530 Board G9BNA Internal DIP Switch Settings

SWITCH	OPTION	SETTING
5	Auto Return Invalid	On

Table B-13. NEC Spinwriter Model 5530 Board G9BNB Internal DIP Switch Settings

DIP	SWITCH	OPTION	SETTING
DIPS1	5	Test Printing	Off
	6	Local/Remote	On (remote) This switch must be Off if the 5530 has a front panel
	7	Line Feed Pitch	Off (6 lines per inch)
	8	Line Spacing	Off (single spacing)
DIPS3	2	Local Line Feed	User Choice (must match the selected printer driver)
	5	Auto Return	Off (auto return off)
	6	Spacing Pitch	Off (10 characters per inch)

Table B-14 lists the front panel switch settings for the Model 5530.

Table B-14. Spinwriter Model 5530 Front Panel Switch Settings

SWITCH	SETTING
Test	Off
LPI (lines per inch)	Must be 6
Single/Double	Must be Single
Remote/Local	Must be Remote

QUME SPRINT 5/45

The program supports the Qume Sprint 5/45 with the Apple Serial Interface card or the Apple Communications Interface card.

If your serial interface card has the P8 PROM, the maximum Baud rate is 300. With the P8A PROM the maximum Baud rate is 1200.

For operation with an unmodified Apple Communications Interface card, the maximum Baud rate is 300. During printing the data may also appear on the screen. When printing is completed, the screen image returns to normal.

Table B-15 lists the printer switch settings for use with the program. Table B-16 lists the Apple Serial Interface card switch settings.

Table B-15. Qume Sprint 5/45 Printer External Switch Settings

SWITCH	SETTING
Auto LF	User Choice (if Off use -LF driver, if On use driver without -LF)
Char. Spacing	Must be 10

Table B-16. Apple Serial Interface Card Switch Settings When Used with the Qume Sprint 5/45 Printer

SWITCH	OPTION	SWITCH SETTING
5,6	Paper Size	User Choice (Must not be set to On/On)

TRENDCOM 200G

No set-up is required. Use the printer driver that matches your configuration.

APPENDIX C

THE VISITREND™/VISIPLOT™ INTERNAL DATA FORMAT

VisiTrend/VisiPlot data series can be stored in either of two formats: the VisiTrend/VisiPlot data format and the DIF format. Data is stored in the VisiTrend/VisiPlot data format when you select NORMAL from the SAVE format menu. It is stored in the DIF format when you select DIF. Data in the DIF format can be used by other Personal Software programs.

The VisiTrend/VisiPlot data format is described in this appendix. The DIF format is described in the document **Programmer's Guide to the Data Interchange Format**, number SATN-18 which is available from the DIF Clearinghouse, P.O. Box 527, Cambridge, MA 02139.

A VisiTrend/VisiPlot data file is an Apple Sequential Text File which is described in **The DOS Manual**, Apple number A2L0036. The fields are variable length and each field is terminated with a RETURN. The following list contains a description of the contents and, in parentheses, the limitations on and expected contents of the fields.

The fields of a data file are:

Number of series (1-16)
Series name (string—up to 14 characters)
Number of data points (1-150)
Periodicity (1-99)
Start year (0-2499)
Start period (1-periodicity)
End year (must be consistent with the start year and
End period period, the periodicity, and number of points)
Data point 1
Data point 2
•
•
•

Data point n

•
•
•

The following is the listing of a sample file containing two series, named FIRST and SECOND. FIRST has a period of 1 and contains five data points beginning at date 1. The values of the data points are 100, 200, 300, 400, and 500. Second has a period 1 and contains 3 data points beginning at date 1980. The values of the data points are 1111, 2222, and 3333.

2	Number of series in file	
FIRST	Series name	first series
5	Number of data points	
1	Periodicity	
1	Start date	
1	Start period	
5	End date	
1	End period	
100		
200		
300	Data points	
400		
500		
SECOND		Second series
3		
1		
1980		
1		
1982		
1		
1111		
2222		
3333		

D

E

F

M

N

O

P

Q

R

S

T

U

V

W

X

Y

READER'S CRITIQUE

Personal Software Inc.'s Publications Department wants to provide documents t meet the needs of all our product users. Your feedback helps us produce bet manuals.

Please tell us how you rate this manual in the following areas:

	Excellent	Good	Average	Fair	Poo
1. Completeness of information.	☐	☐	☐	☐	☐
2. Clarity of information.	☐	☐	☐	☐	☐
3. Organization of manual.	☐	☐	☐	☐	☐
4. Appearance of manual.	☐	☐	☐	☐	☐
5. Quantity of examples.	☐	☐	☐	☐	☐
6. Usefulness of examples.	☐	☐	☐	☐	☐
7. Quantity of photographs and illustrations.	☐	☐	☐	☐	☐
8. Appropriateness of photographs and illustrations.	☐	☐	☐	☐	☐
9. Degree to which this manual meets your expectations and needs.	☐	☐	☐	☐	☐
10. Appropriateness of the manual level to a person of your experience.	☐	☐	☐	☐	☐
11. Overall manual.	☐	☐	☐	☐	☐

	2 years or less	2-5 years	Over 5 years
How much computer experience do you have?	☐	☐	☐

Please specify, by page, any errors you found in this manual.

We would appreciate hearing any other comments and suggestions you have about th manual.

Name _____

Company _____

Street _____

City _____ State _____ Zip _____

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1181 SUNNYVALE, CA 94086

Postage will be paid by addressee

PERSONAL SOFTWARE INC.
1330 Bordeaux Drive
Sunnyvale, CA 94086

PERSONAL SOFTWARE INC.
1330 Bordeaux Drive, Sunnyvale, CA 94086, 408/745-7841

10939-22101

Printed in U.S.A. 7/81

PERSONAL SOFTWARE™

USER ASSURANCE PLAN

replacement

limited warranty

backup

upgrade

registration

IMPORTANT:
Mail enclosed registration card immediately!

How to Use This Booklet

This booklet contains the Limited Warranty statement and describes the Replacement, Backup and Upgrade policies referred to as the "User Assurance Plan" coverage for the user of this Personal Software™ product.

Please follow the directions in your User's Guide and note the following information for your future reference:

Name of Program _____

Date of Purchase _____ Mo _____ Day _____ Yr

Serial Number of Program (If applicable) _____

Version Number of Program _____

Your address AS YOU MAILED IT IN on your Warranty Registration Card:

Company _____

Address _____

City _____ State _____ Zip _____

Country _____

The Warranty Registration Card

Please fill the Warranty Registration Card out completely and mail it in. The postage is paid for your convenience. When your ownership of this product is registered, Personal Software Inc. will have a record of your purchase. Warranty registration enables you to obtain a replacement diskette as detailed in the Limited Warranty statement; in the case of a copy-protected diskette, it permits you to obtain a backup (second) copy. Your name will also be included in Personal Software Inc.'s mailing list, so that if and when upgrades and enhancements to this product become available, you may be notified by mail, and may be eligible to obtain those enhancements at a discount.

The Replacement Order Card

In the event your diskette is found to be defective in materials and workmanship as detailed in the Limited Warranty statement, please return the defective diskette to your local dealer or Personal Software Inc. for replacement if still within the ninety (90) day limited warranty period. After ninety days, and up to one year after date of purchase, replacement diskettes are available for $20.00 only by mail from Personal Software Inc. California residents, please include sales tax. Personal Software Inc. must have received your warranty card in order to ship a replacement diskette. In the event you are applying for a replacement diskette, please fill out the Replacement Order Card completely, and return it with your diskette (and payment if applicable) to:

Personal Software Inc., Customer Service, Dept. RP
1330 Bordeaux Dr., Sunnyvale, CA 94086.

The Backup Order Card

If the Personal Software product you have purchased is copy-protected and if a second diskette is not provided in the original program packaging, you may obtain one backup copy from Personal Software Inc. for $30.00. California residents, please include sales tax. Personal Software must have already received your Warranty Registration Card in order to ship a backup diskette. When ordering a backup diskette, please fill in the Backup Order Card completely, and return it with payment to:

Personal Software Inc., Customer Service, Dept. MRS
1330 Bordeaux Dr., Sunnyvale, CA 94086

Upgrade to Enhanced Products

Personal Software Inc. periodically releases new versions of its products.

Please send in your Warranty Registration Card. It assures that, in the event such a new version of this product becomes available, you may be contacted by mail and may be eligible for upgrading your current product to the new version at a discount.

Limited Warranty Policy

This Personal Software Inc. computer software product may be used to help you manage your business affairs. But no computer software program can replace your sound business judgement, or make decisions for you. You therefore assume complete responsibility for any decisions made or action taken based on information obtained using this software product, instructional or reference materials provided by Personal Software Inc.

Software Program Sold "As Is"

The software program and the enclosed instructional and reference materials are sold "AS IS," without warranty as to their performance, merchantability or fitness for any particular purpose. The entire risk as to the results and performance of this software program is assumed by you.

Limited Warranty for Diskette

However, to the original purchaser only, Personal Software Inc. warrants the magnetic diskette on which the program is recorded to be free from defects in materials and faulty workmanship under normal use and service for a period of ninety (90) days from the date of purchase. If, during this 90-day period, a defect in the diskette should occur, the diskette may be returned to Personal Software Inc. at the address below, or to any authorized Personal Software™ dealer, and Personal Software Inc. will replace the diskette without charge to you, provided that you have previously sent in your Warranty Registration Card to Personal Software Inc., or send proof of purchase with the diskette. If, during the first (1st) year after the date of purchase, a defect in the diskette should occur, the diskette may be returned to Personal Software Inc. accompanied by the attached Replacement Order Card and payment of $20.00 and Personal Software Inc. will replace the diskette for $20.00, provided you have previously sent in your Warranty Registration Card to Personal Software Inc. or send proof of purchase with the diskette. Your sole and exclusive remedy in the event of a defect is expressly limited to replacement of the diskette as provided above. To provide proof that you are the original purchaser, please complete and mail the attached Warranty Registration Card to Personal Software Inc., 1330 Bordeaux Dr., Sunnyvale, CA 94086 within thirty (30) days of purchase.

If the failure of a diskette has resulted from accident, abuse or misapplication of the diskette, then Personal Software Inc. shall have no responsibility to replace the diskette under the terms of this limited warranty.

Any implied warranties relating to the diskette, including any implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the period of ninety (90) days from the date of purchase. Neither Personal Software Inc. nor anyone else who has been involved in the creation and production of this product shall be liable for indirect, special or consequential damages, such as, but not limited to, loss of anticipated profits or benefits, resulting from the use of this product or arising out of any breach of this warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note: Prices subject to change without notice.

REPLACEMENT ORDER CARD

Use this card only to order a replacement for a program diskette found defective in material or workmanship as described in the accompanying Limited Warranty Statement. If your diskette is past the ninety (90) day Limited Warranty period, please enclose this card, the diskette and $20.00 in check, money order or your Visa or Mastercard number. California residents, please include sales tax. Mail to Personal Software Inc., Customer Service, Dept. RP, 1330 Bordeaux Drive, Sunnyvale, CA 94086.

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Country _____
Tel # _____ TLX # _____
Name of Product _____
Serial Number _____
Purchase Date _____ Mo _____ Day _____ Year
Visa Number _____ Exp date _____
Mastercard Number _____ Exp date _____
Interbank Number _____
I enclose check or money order in the amount of $ _____
Signature _____
(Unsigned cards cannot be processed)

Note: Prices subject to change without notice.

BACKUP DISKETTE ORDER CARD

Use this card only to obtain one backup program diskette for your copy protected program. Remember: Some programs may not be copy.protected. One backup copy is available for this program per Warranty Card holder.

When ordering a backup copy, please include this card and $30.00 in check, money order or Visa or Mastercard number. California residents, please include sales tax. Mail to Personal Software Inc., Customer Service, Dept. MRS, 1330 Bordeaux Drive, Sunnyvale, CA 94086.

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Country _____
Tel # _____ TLX # _____
Product Name _____
Serial Number _____
Visa Number _____ Exp date _____
Mastercard Number _____ Exp date _____
Interbank Number _____
I enclose check or money order in the amount of $ _____
Signature _____
(Unsigned cards cannot be processed)

Note: Prices subject to change without notice.

WARRANTY REGISTRATION CARD

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Country _____

Tel # _____ TLX # _____

Title: Principal ___ Pres ___ VP ___ Mgr ___ Engineer ___ Supervisor ___ Other _____

Type of Business:

01 ___ Agriculture	40 ___ Transportation	70 ___ Service
12 ___ Mining	50 ___ Wholesale Trade	80 ___ Medical
13 ___ Petroleum	52 ___ Retail Trade	81 ___ Legal
16 ___ Construction	60 ___ Financial	82 ___ Education
20 ___ Manufacturing	62 ___ Investment	99 ___ Government
36 ___ Electronics/Computers	65 ___ Accounting	

Product Purchased _____ Version Number _____

Serial Number _____ Date Product Purchased ___ Mo ___ Day ___ Yr

Rank Salesperson's Knowledge of Product: Poor ___ Fair ___ Good ___ Very Good ___ Excellent ___

I Learned About the Product Through:

___ Retail Store	___ Salesperson Called on Me	___ Radio Ad
___ Computer Show	___ Magazine Ad in	___ Other
___ Direct Mail	_____	_____
___ Another User	___ Newspaper Ad	_____

Other Personal Software Products Used: ___ VisiCalc ___ VisiDex ___ VisiPlot ___ VisiTrend ___ VisiTerm ___ Desktop/PLAN II ___ CCA Data Management System ___ Other _____

Computer Brand:

___ Atari 800	___ Commodore 8032
___ Apple II	___ TRS-80 Model I
___ Apple III	___ TRS-80 Model II
___ Commodore PET	___ TRS-80 Model III
___ Commodore CBM	___ Other _____

Date Computer Purchased: _____ Mo _____ Day _____ Year

Primary Use of Computer: ___ Business Only ___ Business/Personal ___ Personal/Hobby ___ Educational ___ Other _____

Computer Owned by: ___ Self ___ Employer ___ Other _____

Total Number of all software products purchased for this computer _____

Brands and total numbers of computers at this location:
Atari ___ Apple ___ Commodore ___ Radio Shack ___ Other _____

Three application areas where you intend to use your computer: (Rank 1, 2, 3)

___ Business Finance	___ Data Management
___ Business Analysis	___ Forecasting
___ Personal Finance	___ Trend Analysis
___ Word Processing	___ Presentation Graphics
___ Data Communications	___ Other
___ Time Management	_____

Magazines you subscribe to or read regularly:

___ Byte	___ Output
___ Business Week	___ Popular Electronics
___ Computerworld	___ Time
___ Creative Computing	___ Wall Street Journal
___ Inc.	___ Other
___ Interface Age	_____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1181 SUNNYVALE, CA 94086

Postage will be paid by addressee

PERSONAL SOFTWARE INC.
1330 Bordeaux Drive
Sunnyvale, CA 94086